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NAFTA Rules of Origin

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NAFTA Rules of Origin

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Abstract

The prospects of deepening North American economic integration in a post North American Free Trade Agreement (NAFTA) arrangement through incremental movements toward a customs union or a NAFTA-plus arrangement presents considerable challenges and opportunities. In general, proponents of further economic integration between Canada and the United States stress the administrative and compliance cost savings and efficiency gains associated with eliminating rules of origin, border controls, and other barriers to trade.

Rules of origin for NAFTA, although intended to distinguish between NAFTA originating goods and non-originating goods, can result in both unexpected consequences and economic costs. Intra-NAFTA importers whose goods may or may not qualify for NAFTA preferences must weight the costs associated with using NAFTA preferences against the cost of using most-favoured nation (MFN) tariffs. Importers will choose the tariff preference that is least costly. In this study, we examine the empirical evidence addressing key issues related to the use of NAFTA rules of origin in Canada-US bilateral trade. Moreover, we examine the factors that influence importers' decisions regarding the choice between using NAFTA and MFN status, and provide supporting econometric results.

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1. Introduction

Over the last several years, increased public attention has focused on the potential for deeper North American integration. Discussions prior to 2001 had already demonstrated growing support for further facilitating the cross-border movement of goods and people given that Canada-US trade had reached the point where traditional approaches to border administration and border management were becoming increasingly problematic. Moreover, the post September 11th environment elicited growing Canadian interest in rethinking the Canada-US economic relationship and the North American Free Trade Agreement (NAFTA) in the larger context of an overall security perimeter that would protect and ensure our economic security, our border security, and US homeland security.

Much of the attention deals with the feasibility and desirability of a Canada-US customs union, a perimeter approach, and various NAFTA-plus proposals. Proponents of a Canada-US customs union often stress the administrative and compliance cost savings, and efficiency gains associated with the elimination of rules of origin (ROO), regulatory differences, and other barriers to trade, and the difficulties arising from the application of trade remedies. NAFTA ROO, government procurement restrictions, anti-dumping procedures, intrusive countervailing duty investigations, burdensome regulatory requirements, and other restrictive trade measures, discourage cross-border investment decisions, reduce Canada-US trade flows, and reduce the potential benefits accruing to Canada and the United States as members of a preferential trade agreement.

However, much of the current discussion about enhanced Canada-US economic integration, although extremely informative, has been characterized by the lack of empirical evidence.[1] Moreover, the limited empirical evidence obtained through early studies often provides unreliable guidance for the current debate, since the estimates are dated and reflect a trade environment of an earlier time.

There is an emerging sense that NAFTA was only partially responsible for the growth in Canada-US trade in the 1990s and the Agreement did not provide a sufficiently conducive investment environment within Canada to attract a greater share of foreign direct investment (FDI) targeted at the North American market. The Free Trade Agreement (FTA) and NAFTA may have provided the fundamentals but NAFTA ROO and other non-tariff barriers may have hindered the growth in trade and inbound FDI.

This paper examines and assesses the key issues and evidence associated with the growing concern related to the restrictive nature of NAFTA ROO. In particular, it attempts to shed empirical light on the degree to which NAFTA ROO impose significant compliance costs on traders, restrict the use of NAFTA, and reduce the potential benefits from NAFTA.[2]

The next section examines the structure of NAFTA ROO and the logistical details associated with NAFTA ROO process. Then, we explore several key features of NAFTA ROO and attempt to determine whether they are restrictive, costly, and hamper the use

of NAFTA status by importers. NAFTA ROO are dominated by the substantial transformation requirement and, in particular, the change in chapter criteria. This makes NAFTA ROO restrictive in the sense that this criterion is more difficult to attain than others. We explore the characteristics of the Estevadeordal (2000) ROO restrictiveness index. Following several recent studies, we use this index in a non-parametric estimate of the compliance cost of NAFTA ROO and in our estimates of the determinants of NAFTA utilization.

In Section 4, we explore Canada-US bilateral trade data focusing on NAFTA utilization rates. Although almost all the tariff lines under NAFTA on Canada-US trade are duty free, approximately 50% of Canada-US trade uses NAFTA while the remaining bilateral trade uses most-favoured nation (MFN) status. Section 5 explores NAFTA and MFN utilization and tariff rates through time; NAFTA utilization rates on US imports from Canada peaked in 1997 and 1998, and declined in the following years. In Section 6, we undertake some econometric analysis based on section, chapter, and subheading data, and report on our econometric results examining the determinants of NAFTA utilization. We find that the more restrictive NAFTA ROO, the less NAFTA is used; the higher the MFN tariff, the greater the use of NAFTA. We provide some tentative conclusions in Section 7.

2. NAFTA Rules of Origin Background

Are NAFTA ROO Necessary?

Under NAFTA, as under other free trade agreements, each member country retains its respective external tariffs and other import restrictions against non-members while lowering or eliminating tariffs on goods "originating" from other member countries. All trade under NAFTA is supported by an extensive system of ROO.

Rules of origin define where a product "originates." There are two classes of ROO: non-preferential and preferential. Non-preferential ROO are used to distinguish foreign from domestic products in establishing anti-dumping and countervailing duties, safeguard measures, origin marking requirements, and/or discriminatory quantitative restrictions or quotas.[3] Preferential ROO define the conditions under which the importing country will regard a product as originating in an exporting country that receives preferential treatment under a free trade agreement. They are used to prevent imports from third countries from taking advantage of the concessions made by member countries of the free trade agreement.

In the absence of preferential ROO, imports to the free trade region would come through the country with the lowest external tariff and serve the entire free trade region. This would force a convergence of external tariffs and possibly a competitive devaluation of external tariffs. In essence, ROO are thus a means to operate the FTA and an independent external trade policy.

Preferential ROO provide the method for customs officials to determine which goods are entitled to preferential tariff treatment. Preferential ROO are a necessary and integral part of any free trade agreement.

What Are NAFTA ROO?

Under NAFTA, a good is considered to be an originating good and is entitled to preferential tariff treatment, if it meets one of the five requirements set out in NAFTA ROO (CCRA, 1995):

1. The good is wholly obtained or produced in a NAFTA country (including those goods that are entirely grown, fished, or mined in a member country; it does not include goods purchased in a NAFTA country that were imported from a non-NAFTA country).

2. The good is made up entirely of components and materials that qualify in their own right as goods that originate in a NAFTA country.

3. The good meets the requirements of a specific ROO for that product, as listed in NAFTA Annex 401.[4] With respect to Canadian imports, this normally applies when

goods are produced from material imported from countries other than the United States or Mexico.

4. The good qualifies under NAFTA Article 401(d),[5] which only applies to a few cases.

5. The good consists of automatic data processing equipment or parts qualifying under the provisions of Annex 308.1.

Of these five requirements, the most commonly used is the specific ROO, which applies to a good that includes any non-originating materials in its production. These specific ROO are based on the substantial transformation criteria. At least three methods are used in NAFTA to determine whether there has been sufficient transformation to warrant preferential tariff treatment of the good:

- a change in tariff classification (CTC) requiring the product to change its tariff classification at the item, subheading, heading, or chapter level under the Harmonized Commodity Description and Coding System[6] (HS) in the originating country;

- a domestic or regional value content (RVC) rule requiring a minimum percentage of local value added in the originating country (or setting the maximum percentage of value originating in non-member countries); and

- a technical requirement prescribing that the product must undergo specific manufacturing processing operations in the originating country.

The first step to understanding the NAFTA specific ROO listed in Annex 401 is to understand the HS. It uses a six-digit number to identify basic commodities or subheadings. The HS is organized around 96 chapters arranged in 21 sections. The first two digits indicate the chapter, the first four digits indicate the heading level while six digits identify the subheading level. Within the HS structure, there are over 1,200 headings and over 5,000 subheadings. Appendix 1 illustrates the organization of HS sections and chapters.

Each country is allowed to add additional digits to make the tariff classifications more specific. In Canada, an additional two digits are used for exports and an additional four digits for imports while the United States uses a 10-digit system for imports and exports.

Most specific ROO require a certain HS classification change from the non-originating materials to the finished good. The CTC must result from processing in one or more of NAFTA countries. For example, orange marmalade is classified under heading 20.07 while fresh oranges are 08.05. The specific NAFTA ROO for orange marmalade requires a chapter change. If fresh oranges from Brazil are transformed into orange marmalade in the United States, the orange marmalade is an originating good since a change from chapter 08 to chapter 20 has occurred.

Often the CTC has an additional requirement that must be met for a good to qualify for NAFTA status. Usually, this additional requirement tests the good's regional value content or adds a technical requirement. The RVC rules are used extensively for automotive goods and chemicals, but are quite limited in other product areas.[7] If a rule requires a CTC and an RVC test, the good must meet both of these requirements to qualify as an originating good.

Moreover, in some preferential trade agreements, a choice of origin test is offered for some tariff items. In NAFTA and other agreements based on NAFTA, one test is commonly based on a CTC rule alone, while a second test, for the same tariff items, may involve a CTC rule at a lower level, together with a technical test and/or an RVC requirement. About 34% of all tariff line items at the six-digit level in NAFTA specify an RVC requirement as part of the first or second test.

According to the WTO (2002) survey of ROO, the average threshold on domestic content or RVC varies from 40% to 60% using any method of calculation. NAFTA RVC threshold is 60% if calculated by the transaction value method, or 50%, if calculated by the net cost method.[8]

With NAFTA, a highly disaggregated system of ROO was introduced, with specific rules at the product level (generally using an HS six-digit level of disaggregation). Those specific rules were adopted to close loopholes that might allow third-country producers to benefit from NAFTA status by performing assembly, processing, or minimal production operations in the territory of one of the parties (Carrère and de Melo, 2004).

NAFTA Certificate of Origin and Verification

The three NAFTA members adopted a uniform certificate of origin to certify that goods imported into NAFTA territories qualify for the preferential tariff treatment accorded by NAFTA. Appendix 2 provides a copy of NAFTA certificate of origin. The Agreement relies on the process of self-certification where the certificate of origin must be completed and signed by the producer or exporter of the goods. When the exporter is not the producer, the exporter can complete the certificate on the basis of knowledge that the good originates, reasonable reliance on the producer's written representation that the good originates, or a completed and signed certificate of origin for the good voluntarily provided to the exporter by the producer.

Only importers who possess a valid certificate of origin can claim preferential tariff treatment. A certificate of origin can cover a single importation of goods or multiple importations of identical goods. Certificates that cover multiple shipments are called blanket certificates, and can apply to goods imported within any 12-month period specified on the certificate.

The certificate of origin is only one of the several documents required by importers of goods seeking preferential tariff treatment under NAFTA.[9] Importers must maintain records pertaining to the importation for at least five years, or any longer period that

may be specified by their country. Exporters or producers that provide a certificate of origin must maintain records pertaining to the exportation for five years.

Under NAFTA, the importing country's customs administration can conduct verifications of the exporter or producer to confirm the certificate of origin. Verifications are principally conducted by written questionnaires and verification visits. Additional verification can be done by telephone, facsimile, and information from the supplier as well as on-site audits. Since imports claiming NAFTA status can be subject to post-entry verification and audits while imports from NAFTA members using the MFN tariff are not subject to this process, there is a tendency for importers to take more care in meeting NAFTA requirements.[10] Therefore, we would expect to observe higher NAFTA compliance rates. Post-entry verification has reduced wait times and congestion at the border as a result of moving activities inland.

However, discussions with importers/exporters revealed that some may use MFN status rather than NAFTA to avoid the possibility of post-entry verification and, in particular, verification visits. Therefore, the higher costs associated with the use of NAFTA and the greater the possibility of post-entry audit, the lower NAFTA utilization rates.

3. The Nature of NAFTA Rules of Origin

Are NAFTA ROO Costly?

Rules of origin impose administrative and compliance costs on parties involved in international transactions. Administrative costs refer to the costs incurred by governments in implementing, administering, and monitoring the system of ROO while compliance costs refer to the financial costs incurred by importers, exporters, or producers to meet the ROO requirements to qualify for preferential treatment.

Compliance costs can be thought of as the cost of paperwork or red tape associated with filling out forms to satisfy customs requirements and the cost to business associated with determining, meeting, and proving origin (Australia Productivity Commission, 2004a). This could also include the office systems and computer programs for meeting and proving origin and the cost of maintaining records. These compliance costs are distinct from the economic costs associated with ROO, such as the costs associated with changing production methods or input mixes, and changing input sourcing to meet origin requirements. The economic effects of NAFTA ROO are examined in Section 6.

Earlier estimates of the compliance and administrative costs associated with ROO were often based on pre-computer technology procedures and may overestimate current NAFTA transaction costs. Koskinen (1983) estimated the compliance costs for Finnish exporters under the European Community (EC)-European Free Trade Association (EFTA) FTA at 1.4% to 5.7% of the value of export transactions. Herin (1986) estimated the compliance cost to meet the ROO within the EFTA at 3% to 5% of the price of the good. Those estimates are based on a paper-intensive system. Holmes and Shepard

(1983) found the average export transaction from the EFTA to the EC required 35 documents and 360 copies.

In NAFTA case, the empirical evidence on the administrative and compliance costs is very limited. Krueger (1995: 15) reported: "Canadian producers have on occasion chosen to pay the relevant duties rather than incur the cost of proving origin." Recent discussions with Canadian exporters and importers revealed that for small shipments, exporters with limited knowledge of NAFTA and small-sized firms are likely to pay MFN duties rather than incur the additional expense of meeting NAFTA requirements. In addition, firms that could not get sufficient numbers of certificates of origin from their suppliers chose MFN and paid duty rather than claiming NAFTA status.

Two recent studies, Cadot et al. (2002) and Carrère and de Melo (2004), employed an indirect approach similar to Herin (1986) to estimate the compliance cost of a NAFTA rule. Both studies use a revealed preference approach and provide only an approximation of the compliance cost of NAFTA ROO for imports into the United States from Mexico.

The authors assume that the compliance cost to import the i^{th} good, c_i, is:

$$c_i = {}_i + \sigma_i \qquad (1)$$

where δ_i is NAFTA compliance component and σ_i are the non-ROO costs.[11]

If NAFTA utilization rates U_i are 100% for the i^{th} good, then NAFTA tariff preference is revealed larger than the compliance costs and the preference margin can be used as an upper bound for the compliance costs. For items with $U_i = 0\%$, the preference margin is smaller than the compliance costs and provides a lower-bound estimate.

Where NAFTA utilization rates are $0 < U_i < 100\%$, Cadot et al. (2002) and Carrère and de Melo (2004) assumed the firms were indifferent as to whether they shipped under NAFTA or MFN. This would imply that the expected cost of using NAFTA and the MFN are the same. Therefore, given revealed indifference between the MFN rate and cost of using NAFTA, the authors use the MFN rate or the difference between the MFN and NAFTA rate as a proxy for the costs associated with the use of NAFTA.[12] This provides an estimate of the average NAFTA compliance costs.

The authors assumed that NAFTA compliance component is negligible when U_i is close to 100% and NAFTA ROO is not restrictive, $r_i \leq 2$.[13] The tariff preference when U_i is close to 100% and $r_i \leq 2$ would provide an estimate of the non-ROO administrative costs, σ_i.

Employing this revealed preference approach, Cadot et al. (2002) calculated the cost of compliance and other NAFTA-related administrative procedures for imports in 2000 from Mexico into the United States at 5.06% of the value of Mexican exports. When non-ROO administrative costs, estimated at 3.12%, are subtracted from the preceding estimates, the authors found that the compliance costs of NAFTA ROO to the private sector for exports from Mexico into the United States are 1.94% of the value of Mexican exports.

Carrère and de Melo (2004), using 2001 data on Mexican exports to the United States, arrived at an average compliance cost estimate of 1.72% of the value of exports based on a total estimated cost of 6.16%.[14]

Following Cadot et al. (2002) and Carrère and de Melo (2004), we employ this non-parametric indirect approach based on revealed preferences to approximate the upper bounds on the compliance cost of NAFTA ROO using HS six-digit data on imports into the United States from Canada for 2003.

Where NAFTA utilization rates are $0 < U_i < 100\%$, we find the trade compliance costs to be 5.37% of the price for Canadian goods imported into the United States. Examining cases where $95\% \leq U_i < 100\%$ and $r \leq 2$ we find the non-ROO costs associated with importation to be approximately 4.32%.[15] Subtracting the non-ROO costs from the trade compliance costs provides an estimate of 1.05% for NAFTA ROO compliance costs. This is significantly lower than estimates from the Mexican data and may be due to the wider use of information and communication technologies, the greater maturity of Canadian and American firms, and the Canada-US FTA experience by firms engaged in trade on the northern border compared to their Mexican counterparts.

Table 1: Non-Parametric NAFTA Compliance Cost Estimates

Study	Imports to US from	NAFTA ROO compliance cost
Cadot et al. (2002)	Mexico	1.94
Carrère and de Melo (2004)	Mexico	1.72
This study	Canada	1.05

It should be noted that these estimates need to be viewed with caution since they provide only a upper-bound proxy for the compliance cost of ROO. The question remains how much this upper bound may deviate from the true cost of NAFTA ROO or a statistically unbiased estimate.

Are NAFTA ROO Too Restrictive?

As an integral component of a free trade agreement, ROO are intended to ensure that the benefits from an agreement accrue to its members. However, a particular ROO system can be liberal, promoting the flow of intra-bloc trade, or restrictive,[16] acting as a non-tariff barrier to trade within the preferential trade region.

Estevadeordal (2000) developed a categorical index on the restrictiveness of a given type of ROO ranging from 1 (least restrictive) to 7 (most restrictive). The index is based on two assumptions.

- A required CTC at the level of chapter is more restrictive than a CTC at the level of heading, and a CTC at the level of heading is more restrictive than a CTC at the level of subheading, and so on.

- Regional value content and technical requirement criteria attached to a given change in tariff classification add to the level of restrictiveness of the specific ROO.

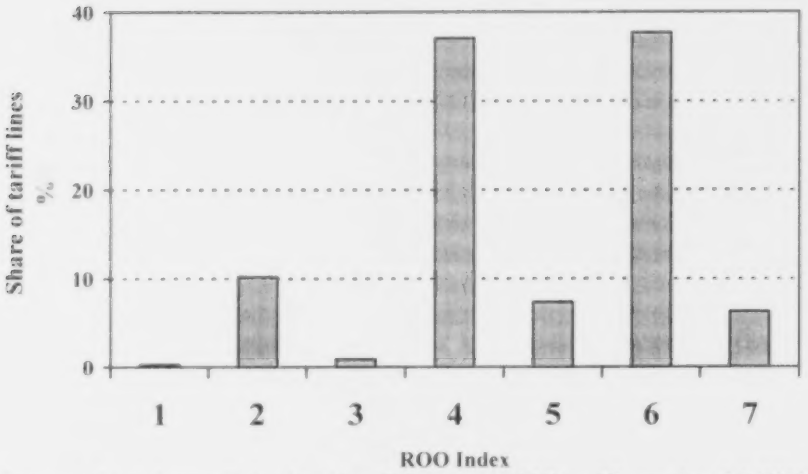
Estevadeordal (2000) constructed the categorical variable, r, assigning to each HS eight-digit category an ordered numerical value according to the observation rules in Table 2.[17]

The index can be aggregated to the chapter, section, or agreement level. Examining NAFTA exports from Canada to the United States, approximately 45% of all tariff lines (HS eight-digit) required a change in classification at the chapter level or more. Correspondingly, the majority of all tariff lines (51%) were represented by an index of 5 or higher while 11.4% of all tariff lines have an index of 3 or less (see Figure 1).[18] Almost 75% of all NAFTA tariff lines applied to Canadian exports to the United States required a change in tariff classification at the heading level (r = 4) or at the chapter level (r = 6).

Table 2: ROO Restrictiveness Index Criteria	
r = 1	If a change at the item level is required
r = 2	If a change at the subheading level is required
r = 3	If a change at the subheading level plus an additional requirement is specified
r = 4	If a change at the heading level is required
r = 5	If a change at the heading level plus an additional requirement is specified
r = 6	If a change at the chapter level is required
r = 7	If a change at the chapter level plus an additional requirement is specified

Estevadeordal (2000) found that compared to other free trade agreements, NAFTA ROO are very restrictive with an average restrictiveness index of 5.1 compared to the Pan-European ROO rated at 4.5, the EFTA-Mexico[19] ROO rated at 4.2 and the non-preferential ROO average of 3.9. NAFTA ROO are stringent due to the predominant use of the change in chapter criterion.

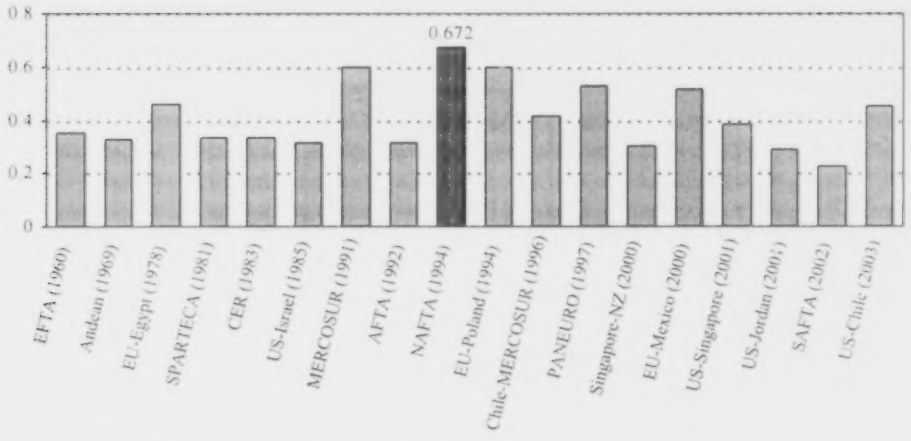
Figure 1: NAFTA ROO Restrictiveness Index and Tariff Lines for Canadian Exports to the United States (2003)



Source: Authors' compilation based on USITC data (2003) and Estevadeordal (2000) index.

The Australia Productivity Commission (2004a,b) extended the ROO restrictiveness index to include 11 restrictiveness categories and normalized the index to a scale from 0 to 1 (see Figure 2). Since this methodology features a weighted sum over the 11 categories, it is particularly well suited for inter-preferential trade agreement (PTA) comparisons of ROO restrictiveness. For a description of the Commission's methodology, see Appendix 3.

Figure 2: Restrictiveness Index for Preferential ROO
0 (least restrictive) to 1 (most restrictive)



Source: Australia Productivity Commission (2004a,b)

Compared to the ROO restrictiveness level associated with other preferential trade agreements (PTAs), NAFTA ROO are the most restrictive in the sample of 18 PTAs. In addition, a comparison of the restrictiveness of NAFTA ROO to the four other US free trade agreements (United States-Israel, United States-Singapore, United States-Jordan and United States-Chile) indicates that NAFTA ROO are the most restrictive.

Why are NAFTA ROO so restrictive? Rules of origin can be used as a means of industrial policy, and this often leads to differences in restrictiveness between sectors and specific ROO for selected products. In this regard, ROO raise a larger question about the possible role of industrial policy, with the trade-off being between less strict ROO and hence more intra-NAFTA trade versus stricter ROO that potentially protect domestic sectors. Restrictive ROO can be viewed as a new form of hidden protectionism acting as a substitute for inter-free trade agreement tariff barriers that were eliminated and as a tool of industrial policy.[20] This appears to be the core of the problem with restrictive ROO where some free trade agreements have negotiated industrial policy into the agreement by using more restrictive ROO in specific sectors and for specific products as substitutes for tariffs.

In many agreements, special treatment or more restrictive ROO are found in sensitive sectors, such as textiles and clothing, the automotive sector, agriculture, and some electronics industries. A sectoral examination of NAFTA ROO by Estevadeordal and Miller (2002) documented "missed preferences," (i.e., utilization rates below 100%) between the United States and Canada, which they attributed to the tightening of the ROO under NAFTA in 1994. Estevadeordal and Miller demonstrated that the agriculture, textiles and apparels, transportation equipment, and automobile sectors implemented stricter ROO with NAFTA than with the FTA.

For the automobile sector, NAFTA introduced stricter ROO compared to earlier trade agreements. While under the Auto Pact and the former Canada-US FTA, duty-free trade between participants was contingent on a 50% Canadian or US content; the threshold increased to 56% on January 1, 1998 and to 62.5% on January 1, 2002 for passenger cars, light trucks, small buses (transport of 15 or fewer persons), their engines and transmissions. The corresponding level for heavy-duty vehicles, large buses, and all other parts is 60% since January 1, 2002. Companies operating in Canada are required to meet these increased regional value content levels plus, in most cases, in the automobile sector a change in tariff classification at the heading level to export to Mexico and the United States at NAFTA rates.

For textiles and apparel, the origin criteria require that most of the production occurs in North America. The production of most textile and apparel goods is a four-step process.

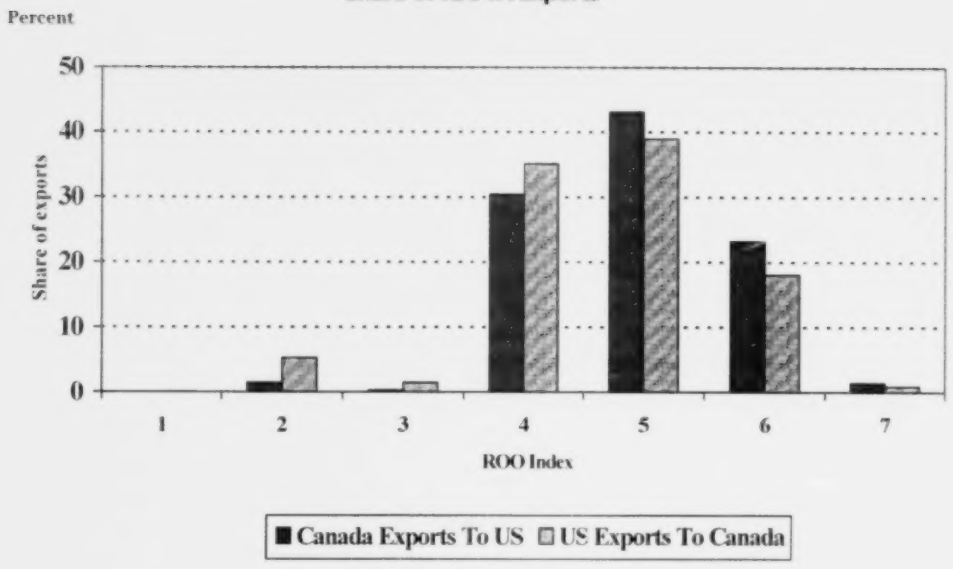
- Fibres, hair, wool, and other raw materials are gathered or harvested.
- Fibres are spun to make a yarn.
- The yarn is woven into a fabric.
- The fabric is cut and sewed (or assembled) into a garment.

The basic origin rules for textiles and apparel are "yarn forward" and "fibre forward." This means that the yarn or fibre, whichever applies, used to form the fabric must originate in a NAFTA country. Put differently, apparel products imported into the United States must satisfy a "triple transformation" rule requiring domestic content of each one of three transformations stages: fibre to yarn, yarn to fabric, and fabric to garment (Cabot et al., 2002).

According to the WTO (2002), NAFTA ROO may have increased trade diversion in favour of NAFTA partners, notably in the clothing sector (the yarn forward rule) and the motor vehicle component sector. They may have also penalized Canadian clothing manufacturers using inputs from MFN sources and contributed to the lack of international competitiveness of the North American textiles and clothing industries.

An alternative way of examining the coverage of the ROO index is to examine the relationship between the index and the share of imports as shown in Figure 3. In 2003, 67.7% of US imports from Canada under NAFTA were covered by a restrictiveness index of 5 or more. In addition, 25% of US imports from Canada under NAFTA required a change at the chapter level (r = 6) or higher. This compares with only 57.9% of Canadian NAFTA imports from the United States being covered by an index of 5 or more, while about 19% of NAFTA imports into Canada from the US required a change of tariff classification at the chapter level (r = 6 or 7) or higher.

Figure 3: NAFTA ROO Restrictiveness Index and Share of NAFTA Exports



Source: Compilations based on Statistics Canada and USITC 2003 data.

This suggests that even though Canada and the United States face the same set of NAFTA ROO, the composition of trade results in imports into the United States from Canada experiencing more stringent NAFTA ROO than imports into Canada from the United States.

4. Do NAFTA Importers Use NAFTA Preferences?

What Is the Incentive Structure to Use NAFTA?

Restrictive and costly NAFTA ROO create an incentive to use the MFN tariff rates rather than NAFTA to avoid ROO compliance costs. As such, restrictive ROO reduce NAFTA utilization rates and the benefits resulting from the agreement.

When importers of NAFTA goods into the United States have the choice of paying a positive MFN tariff or using the lower NAFTA rate (positive tariff preferences) but incur the costs of NAFTA ROO, the importers will choose the least-cost method of importation. Without any additional transaction costs, when NAFTA and MFN rates are the same (i.e., no positive tariff preference), importers choose to use the MFN rate since it does not involve NAFTA ROO-related costs and avoids the possibility of origin verification.[21] Hence, all else remaining equal, as MFN rates fall due to multilateral trade liberalization, we should observe fewer importers using NAFTA and more using MFN on bilateral trade between Canada and the United States.

It is interesting to note that there appears to be a common misconception among the public that most intra-North American trade occurs using NAFTA. In 2002, 54% of total US imports from Canada entered under NAFTA regime and 45% entered at MFN rates.[22] Similarly, approximately 50% of imports from the United States to Canada entered under NAFTA while 62% of imports into the United States from Mexico used NAFTA regime and 37% at MFN rates for 2002. Intra-North America trade outside NAFTA regime may reflect exporters taking advantage of the prevailing zero or low MFN rates since NAFTA margin of preference is not sufficiently attractive to offset the cost of complying with ROO requirements.

Are There Sectional Differences in NAFTA Utilization?

Examining NAFTA utilization rates by sector for Canadian exports into the United States reveals large inter-sectional differences (see Table 3). Canada has high utilization rates for fats and oils (98%), textiles and apparels (95%), plastics (94%), and transportation equipment (85%). However, Canadian exporters have extremely low NAFTA utilization rates for jewellery (14%), wood products (17%), pulp and paper (19%), arms and ammunitions (22%) and chemicals (26%).

Table 3: NAFTA Utilization Rates and Restrictiveness Index Imports from Canada into the United States

	NAFTA Utilization Rate[1] %	Estevadeordal Restrictiveness Index[2] %
1. Live animals, animal products	33	6.0
2. Vegetable products	72	6.0
3. Fats and oils	98	5.9
4. Prepared food, beverages, tobacco	64	5.7
5. Mineral products	45	5.6
6. Chemicals	26	3.1
7. Plastics	93	4.8
8. Leather goods	57	5.6
9. Wood products	19	4.1
10. Pulp and paper	26	5.4
11. Textiles and apparel	94	6.0
12. Footwear, headgear, etc.	72	4.8
13. Article of stone, plastic, glass, etc.	58	5.1
14. Jewellery	14	5.3
15. Base metals	62	4.8
16. Machinery, electrical equipment	41	3.8
17. Vehicles, transport equipment, etc.	85	4.2
18. Optical, photographic, etc.	40	4.3
19. Arms and ammunition	22	5.4
20 Miscellaneous	15	5.8
Average	**52**	**5.1**

Notes:
[1] Authors' calculations based on 2003 USITC data.
[2] Estevadeordal (2000) and updates on the restrictiveness index.

These sectional differences may be a reflection of the restrictiveness associated with the specific ROO, the inter-sectional differences in the MFN tariff rates versus NAFTA rate, the difference in the ability to qualify for NAFTA status and the degree of trade friction found within the sector.

Carrère and de Melo (2004), using an econometric approach, found for Mexican exports into the United States that NAFTA utilization rates are positively influenced by the tariff preference margins. They also found that additional technical requirements, regional value content, and the change in tariff classification at the chapter level are an impediment to NAFTA utilization.

In a later section of this paper, we report the findings of our econometric work, which takes advantage of section, chapter and subheading trade data. Our results based on US imports from Canada data confirm the Carrère and de Melo (2004) findings, which focused on US imports from Mexico.

Are There Differences in Canadian and US NAFTA Utilization?

Do Canada and the United States differ in their pattern of use of NAFTA? Importers into the United States should have a greater tendency to use NAFTA compared to importers into Canada due to a fee that is charged on imports into the United States using MFN/NTR[23] that is not charged when using NAFTA. The merchandise processing fee (MPF) is collected by the US Bureau of Customs and Border Protection on most goods imported into the United States that do not qualify for any special programs, such as NAFTA. This non-refundable fee charged by US Customs for administrative expenses for processing an imported shipment requiring formal entry is accessed at 0.21% of the value subject to a $25 minimum and a $485 maximum. However, shipments valued at less than $2,000 are assessed a $2 fee. There is no comparable fee for imports into Canada.

Discussions with large Canadian exporters of goods into the United States indicate that the MPF is one factor taken into consideration when deciding between using NAFTA preferences and MFN rates. It is viewed as a major irritant to Canadian shippers but makes using NAFTA status marginally more appealing.

A preliminary comparison between Canadian and US NAFTA utilization rates for bilateral trade (see Table 4) reveals that, based on the sections average, imports from the United States into Canada use NAFTA preferences about 48% of the time compared to 52% for imports from Canada into the United States. More striking are the large inter-country differences for NAFTA utilization rates between Canada and the United States at the section level. Of the 20 sections compared, six sections reflect an inter-country difference in NAFTA utilization rates of less than 10 percentage points, six sections with an inter-country difference between 10 and 20 points and eight sections with an inter-country difference in NAFTA utilization rates of greater than 20.

Table 4: NAFTA Utilization Rates by Sectors for Canada – United States Trade, 2003			
	U.S. Imports from Canada[1]	Canadian Imports from United States[2]	Inter-Country Difference
1. Live animals, animal products	33	50	-16
2. Vegetable products	72	21	51
3. Fats and oils	98	93	5
4. Prepared food, beverages, tobacco	64	81	-16
5. Mineral products	45	24	21
6. Chemicals	26	53	-27
7. Plastics	93	82	11
8. Leather goods	57	37	21
9. Wood products	19	30	-11
10. Pulp and paper	26	28	-2
11. Textiles and apparel	94	84	10
12. Footwear, headgear, etc.	72	71	0
13. Article of stone, plastic, glass, etc.	58	43	15
14. Jewellery	14	17	-3
15. Base metals	62	49	14
16. Machinery, electrical equipment	41	23	18
17. Vehicles, transport equipment, etc.	85	55	30
18. Optical, photographic, etc.	40	16	25
19. Arms and ammunition	22	52	-29
20 Miscellaneous	15	55	-40
Average utilization rate based on sections	52	48	6
Overall utilization rate:[3] aggregate	57	44	13

Notes:
[1] Authors' calculations based on 2003 USITC data.
[2] Authors' calculations based on 2003 Statistics Canada data.
[3] The overall utilization rate does not include section 21.

To date, these large inter-country differences within sections have not been explained. We speculate that inter-country differences in MFN rates, trade patterns within sections, and trade policy differences may be partly responsible for these differences.

Overall NAFTA utilization[24] rates reveal that 57% of all imports into the United States from Canada used NAFTA status while only 44% of all imports into Canada from the United States used NAFTA. Given the relative size of the Canadian market, Canadian producers and manufacturers tend to be more export oriented with a particular focus on the United States. More important, a small number of large firms account for a major share of Canada's exports to the United States. According to Sulzenko (2003), in 2001 the top five exporters accounted for almost half, and the largest 2,000 firms accounted for over 80% of Canada's exports to the United States. With the paramount importance of the United States as Canada's principal export market and the concentration of firms that export to the US market, Canadian producers and exporters tend to be more focused on meeting NAFTA ROO requirements in production and manufacturing and, as a matter of

course, provide the necessary certificates of origin to US importers. This is reflected in the higher NAFTA utilization rates.

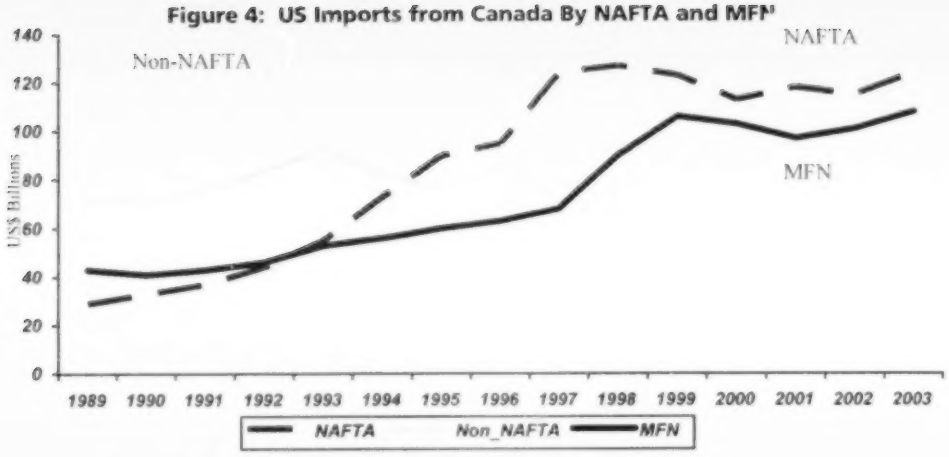
5. NAFTA Utilization Through Time

For a more comprehensive understanding of NAFTA and ROO, we provide additional background on FTA and NAFTA utilization. First, we compare the growth in US imports from Canada under NAFTA versus MFN[25] and then examine the size and growth of duty-free and dutiable imports over time. Then, we focus on NAFTA utilization on Canada-US bilateral trade over time. We also calculate NAFTA utilization over time where the MFN tariff rates are positive, and similarly for commodities facing zero and positive NAFTA tariffs. We conclude by identifying some sectors (HS sections) of special interest.

Has the Pattern of NAFTA and MFN Imports Changed?

The growth in US imports from Canada under both NAFTA and MFN programs from 1990 to 2003 is illustrated in Figure 4. This period witnessed considerable trade liberalization, including the implementation of the Canada-US FTA, NAFTA and the general downward drift of MFN as a result of multilateral initiatives. However, there are two distinct sub-periods over this 14-year span. The period from 1990 to 1999 witnessed spectacular growth in US imports from Canada under NAFTA rising over 300% from $29 billion to $127 billion (constant 2000 US$). Then NAFTA imports from Canada to the United States levelled off and remained relatively stable at $180 billion (constant 2000 US$) from 2000 to 2003. The MFN imports also increased, but at a somewhat slower pace until 1997 at which time they grew more quickly than NAFTA imports until 2000.[26] By 2000, however, MFN imports into the United States from Canada levelled off. Since the mid-1990s, most US imports from Canada have taken place under NAFTA. But by 2003, the difference between NAFTA and MFN imports amounted to only US$14 billion on total imports of US$226 billion.

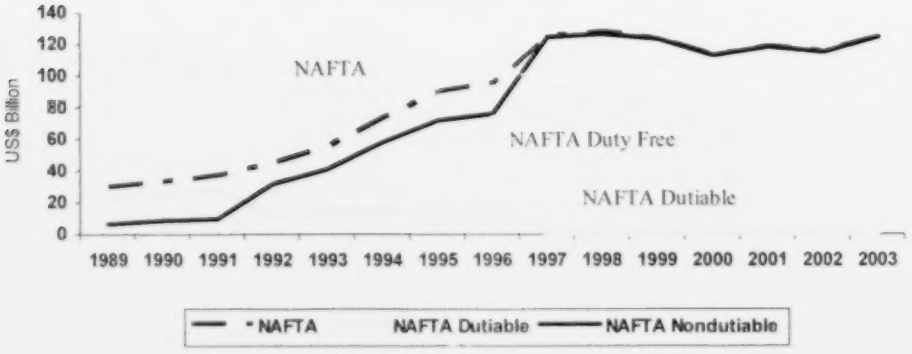
Figure 4: US Imports from Canada By NAFTA and MFN



Source: Authors' calculations based on USITC data in 2000 US constant dollars.

Disaggregating NAFTA imports into dutiable and duty-free imports, we observe that the spectacular rise in NAFTA imports until 1997 was due to the growth in the duty-free component (see Figure 5). Although NAFTA duty-free component was initially the smaller of the two components, the duty-free component has risen quickly, so by 1997 NAFTA imports were almost exclusively duty free. This pattern of NAFTA duty-free imports is a reflection of the phasing in of FTA/NAFTA tariff reductions between Canada and the United States.

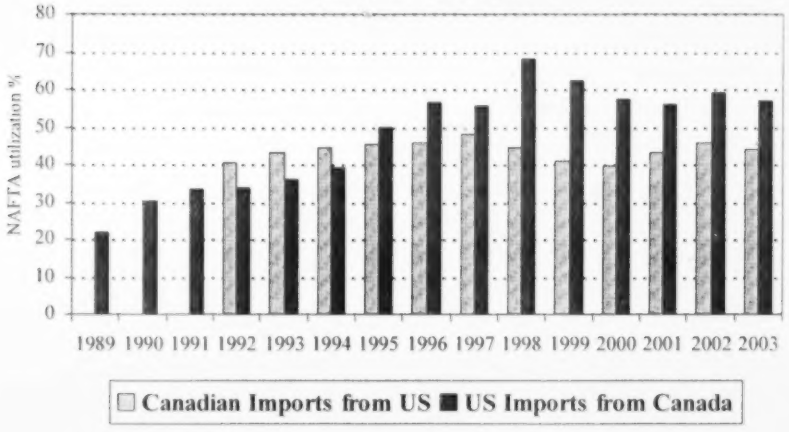
Figure 5: US NAFTA Imports from Canada (Dutiable and Nondutiable)



Source: Authors' calculations based on USITC data in 2000 US constant dollars.

An alternative way to examine the growth in the use of NAFTA is to focus on utilization rates. The growth in the use of NAFTA by Canadian exporters to the United States during the first half of the 1990s was outstanding where utilization rates moved from less than 25% in 1989 to approximately 68% in 1998 (see Figure 6). From 1998 to 2003, approximately 54% of all imports into the United States from Canada used NAFTA status.

Figure 6: NAFTA Utilization[1] 1989-2003
Canada - US Trade



[1] NAFTA utilization based on subheading data excluding section 21.
Source: Authors' calculations based on Statistics Canada and USITC data.

What comes as a surprise is the peak in NAFTA utilization rate by US importers in 1998 and the subsequent decline in the late 1990s. In 1997, NAFTA utilization by US importers was 56%, jumping to 68% in 1998, declining to 62% in 1999, and averaging around 57% in the post-1998 period.

Comparing Figures 4, 5 and 6 provides a revealing story. The year 1997 witnessed the start of the accelerated growth in imports under MFN duty free while US imports from Canada under NAFTA peaked in 1997 and declined slightly in dollar value. Taken together, this resulted in a decline in NAFTA utilization rate. Given the choice between NAFTA duty free and MFN duty free, importers will choose the latter, since it costs less to import despite the additional cost of the merchandise processing fee.

NAFTA utilization for Canadian imports from the United States reveals a slightly different pattern.[27] The growth in the use of NAFTA was considerably less pronounced for imports into Canada from the United States moving from a 40% utilization rate in 1992 and peaking at a 48% utilization rate in 1997. Post-1997 shows a declining utilization rate in the 44% range in 2001 to 2003. From 1992 to 2003, the NAFTA utilization rate for imports into Canada from the United States remained in the 40% to 50% range.

Comparing NAFTA utilization on Canada-US bilateral trade shows that US imports from Canada had a significantly higher NAFTA utilization rate than Canadian imports from the

United States. From 1997 to 2003, 56% of US imports from Canada used NAFTA status while only 44% of Canadian imports from the United States used NAFTA. The NAFTA utilization rate peaked in 1997 on Canada-US bilateral trade and subsequently declined. Overall, Canadian importers of US goods use NAFTA about 10 percentage points less than US importers of Canadian goods.

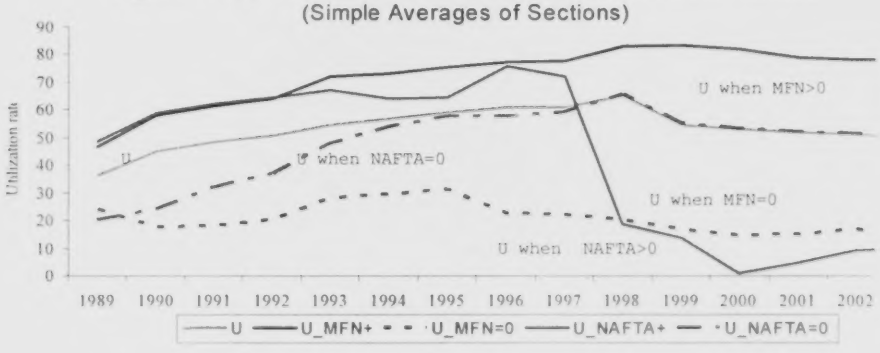
Do MFN Rates Influence NAFTA Utilization?

The level of NAFTA utilization changed over the 1989-2003 period as tariff rates under both NAFTA and the MFN fell. The average overall NAFTA utilization rate rose steadily between 1989 and 1997, declined thereafter until 2000, and has been relatively stable since. This was illustrated earlier in Figure 6.

To gain additional insight into the behaviour of NAFTA imports, we segment NAFTA import data into situations where tariffs are positive or zero. In particular, we calculate NAFTA utilization rates through time for five cases:

- overall NAFTA utilization (U);
- MFN tariffs rates are positive (U when MFN>0);
- MFN tariffs rates are zero (U when MFN=0);
- NAFTA tariff rates are positive (U when NAFTA>0); and
- NAFTA tariffs rates are zero (U when NAFTA=0).

Figure 7: NAFTA Utilization Rates of US Imports from Canada
(Simple Averages of Sections)



Source: Based on USITC.

These NAFTA utilization rates are shown in Figure 7.

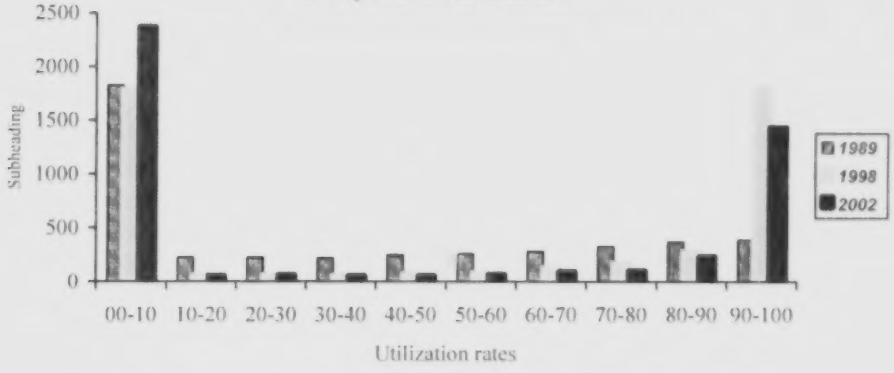
Several striking features become apparent. First, NAFTA utilization is very high at around 80% when the MFN tariff is positive. Firms attempting to minimize costs will weigh the cost of NAFTA ROO against the cost of the MFN tariff. The higher the MFN tariff, the more likely firms will use NAFTA. Nevertheless, the fact that U is significantly lower than 100% indicates that the costs of ROOs create a powerful incentive to switch to MFN. Second, NAFTA utilization rates have been relatively stable but low when the MFN

tariff was zero. In this case, NAFTA utilization has been around 15% since the mid-1990s. When both the MFN and NAFTA tariff rates are zero, it costs less to use MFN than NAFTA. Hence, firms will import MFN duty free rather than NAFTA duty free since the former does not involve the additional costs associated with NAFTA ROO. Third, FTA utilization for those commodities that had not yet become NAFTA duty free plummeted around 1998. The use of NAFTA fell where NAFTA duty was positive since the number of dutiable NAFTA goods fell rapidly as a result of the final phase in NAFTA duty-free status for Canada-US bilateral trade. Finally, the overall NAFTA utilization rate increased through the 1990s peaking during the late 1990s. Since then, NAFTA utilization has fallen to the 50% range where about half of all goods imported into the United States from Canada use NAFTA.

A Disaggregate Look at NAFTA Utilization

We examine the frequency of subheadings and the relationship to NAFTA utilization rates over the 1989-2003 period for US imports from Canada.[28] Our results are illustrated in Figure 8a.

Figure 8a: HS Subheadings and FTA-NAFTA Utilization
US Imports from Canada



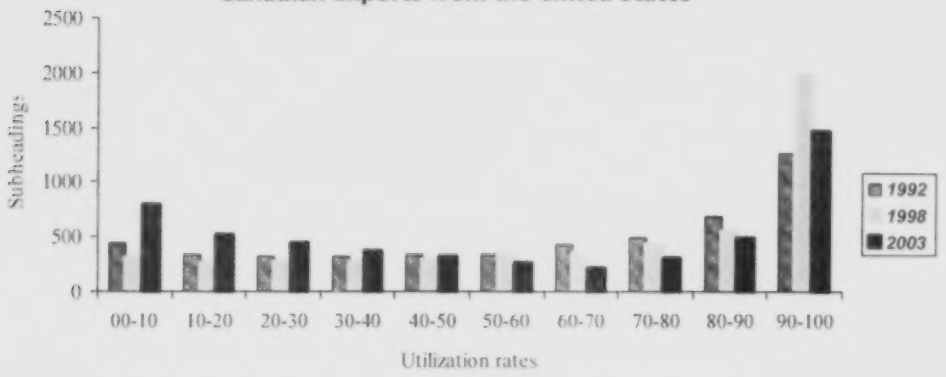
Source: Based on USITC data.

Comparing the two extremes through time, we observe that the prevalence of zero or low NAFTA utilization has increased since 1998 while high or 100% NAFTA utilization has fallen. Moreover, there has been a "hollowing" out of the middle of NAFTA utilization range over time (commodities in each of the 10-20 to 80-90 utilization levels). This represents the distribution across subheadings of the decline in the use of NAFTA particularly from 1998 to 2002.

The data for Canadian imports from the United States reveal a different story as shown in Figure 8b. NAFTA utilization rates for Canadian imports are clustered at the upper end while the remainder are distributed relatively uniformly over the spectrum of utilization.

Historically, utilization rates decline for those sectors with rates greater than 50% while rates grow for sectors with less than 50% NAFTA utilization.

Figure 8b: HS Subheadings and FTA-NAFTA Utilization
Canadian Imports from the United States



Source: Authors' calculations based on Statistics Canada data.

We must note that utilization rates vary among HS sections and through time. For US imports from Canada, as illustrated in Table 5a, NAFTA utilization rates in some sections, such as fats and oils, remained high and stable throughout the period, while others sections, such as vegetables, reflected continual growth. The most dramatic growth in NAFTA utilization has been in transport equipment, from 4.4% in 1989 to 91.7% in 1998 and 85.0% in 2003. NAFTA utilization for footwear was high until 1998 but has fallen back to its pre-FTA level. NAFTA utilization in several other HS sections fell right after 1998 with the most dramatic decrease occurring in arms and ammunition from a 90% NAFTA utilization rate to 22% between 1998 and 2003. The 33% NAFTA utilization rate recorded for live animals in 2003 marked the first time in 10 years that its NAFTA utilization rate fell below 40% and may reflect the mad cow fall-out.

Table 5a: NAFTA Utilization By Section, 1989-2003
US Imports from Canada

		1989	1992	1995	1998	2002	2003
1	Live animals, animal products	35	54	49	49	46	33
2	Vegetable products	49	65	68	71	75	72
3	Fats and oils	86	97	96	97	98	98
4	Prepared food, beverages, tobacco	58	74	70	71	59	64
5	Mineral products	47	57	54	47	49	45
6	Chemicals	30	44	45	43	32	26
7	Plastics	70	84	87	93	93	93
8	Leather goods	47	42	48	52	58	57
9	Wood products	4	5	17	26	17	19
10	Pulp and paper	6	12	17	23	26	26
11	Textiles and apparel	66	89	90	96	95	94
12	Footwear, headgear, etc.	76	95	97	98	72	72
13	Article of stone, plastic, glass, etc.	44	57	69	81	57	58
14	Jewellery	1	21	40	37	15	14
15	Base metals	42	59	57	69	65	62
16	Machinery, electrical equipment	23	42	53	63	41	41
17	Vehicles, transport equipment, etc.	4	11	49	92	88	85
18	Optical, photographic, etc.	22	43	57	72	45	40
19	Arms and ammunition	6	48	89	90	26	22
20	Miscellaneous	44	66	86	93	15	15
	Average of Sections[1]	**38**	**53**	**62**	**68**	**54**	**52**
	Overall Utilization	**28**	**34**	**50**	**68**	**59**	**57**

Note:
[1] The average of sections and overall utilization are calculated excluding section 21.
Source: Authors' calculations with USITC data for various years.

In fact, in 9 out of the 21 sections for US imports from Canada, NAFTA utilization rates fell more than 10 percentage points between 1998 and 2003 pulling down the overall 2003 utilization average. NAFTA utilization rates peaked in 1998 for 13 of the 21 sections causing the average NAFTA utilization rate also to peak. The question remains what caused this peak in NAFTA utilization rate and what caused the subsequent decline?

The historical usage of NAFTA across HS sections for imports from the United States into Canada shows different patterns as illustrated in Figure 5b.

Table 5b: NAFTA Utilization By Section, 1992-2002 Canadian Imports from United States						
		1992	1995	1998	2002	2003
1	Live animals, animal products	67	66	65	49	50
2	Vegetable products	68	70	64	26	21
3	Fats and oils	85	92	95	93	93
4	Prepared food, beverages, tobacco	80	84	86	83	81
5	Mineral products	20	33	34	19	24
6	Chemicals	65	67	65	56	53
7	Plastics	70	81	82	82	82
8	Leather goods	63	58	58	46	37
9	Wood products	31	33	37	30	30
10	Pulp and paper	54	60	61	43	28
11	Textiles and apparel	81	87	89	87	84
12	Footwear, headgear, etc.	70	78	81	74	76
13	Article of stone, plastic, glass, etc.	60	61	56	43	43
14	Jewellery	20	20	41	19	17
15	Base metals	64	69	67	56	49
16	Machinery, electrical equipment	39	44	37	25	23
17	Vehicles, transport equipment, etc.	18	15	20	53	55
18	Optical, photographic, etc.	28	28	26	20	16
19	Arms and ammunition	22	44	62	59	52
20	Miscellaneous	71	68	67	58	56
	Average of Sections[1]	**54**	**58**	**60**	**51**	**48**
	Overall Utilization	**41**	**45**	**44**	**46**	**44**

Note:
[1] The average of sections and overall utilization are calculated excluding section 21.
Source: Authors' calculations based on Statistics Canada data for various years.

In 18 of 20 sections for imports into Canada from the United States, NAFTA utilization rates fell from 1998 to 2003 with 12 sections falling more than 10 percentage points. Transport equipment (section 17) posted the only increase in NAFTA utilization moving from 20% to 55% while plastics (section 7) remained the same at 82%. The overall utilization rate for imports into Canada, calculated as the value of imports using NAFTA divided by the value of imports from the United States, remained relatively constant over the last 10 years, while the utilization rate calculated as the average of sections shows a rising trend, peaking in 1998 and subsequently declining.

6. What Are the Economic Effects of NAFTA ROO?

There are several drawbacks to the use of restrictive ROO as outlined in the research literature. The three most often cited adverse effects are restricted trade, misdirected investment, and distorted sourcing and production decisions.[29]

First, with restrictive ROO and high transaction costs, there can be significant resource costs associated with the application of ROO. The private sector incurs compliance costs (broker fees, additional accounting costs, audit costs, etc.) to meet the origin requirements while the public sector incurs administrative costs (customs costs, audit costs, etc.). The costs of ROO raise consumer prices, and decrease producer returns and the volume of exports that otherwise would have occurred, thereby directly reducing the net benefits accruing to NAFTA members. The more restrictive and costly ROO, the greater the reduction in net benefits from a free trade agreement. In this case, restrictive ROO serve as a traditional barrier to trade, that is, to protect domestic producers of final goods when the ROO are so administratively or technically difficult to comply that they serve as a non-tariff barrier to trade (LaNasa, 1995).

Second, restrictive ROO may distort the location of production and investment decisions. Estevadeordal and Suominen (2004) identified two types of investment diversion that could occur as a result of restrictive ROO. First, there is the case where final goods producers from outside the free trade agreement "jump" the ROO by locating plants within a free trade agreement region to satisfy the ROO even if the PTA region was not the most optimal location for investment. Second, ROO can result in investment diversion within the FTA area since outside producers will have an incentive to locate in the largest FTA market and locate in the FTA member region with the lowest external tariffs, such as the United States, in the context of NAFTA.

NAFTA ROO can create a bias toward investment in the United States since multinational firms seeking larger markets have the incentive to minimize the uncertainty and resource costs associated with ROO. These costs, border costs, additional transportation charges for goods targeted for the US market, and investors' desires to secure access to the US market add a bias toward investing in the United States compared to Canada. This may be a contributing factor explaining why Canada witnessed a decline in the share of North American bound FDI.

Third, restrictive ROO can create incentives for producers to use member country inputs to satisfy ROO requirements rather than third country inputs even though third country inputs may be available at lower cost. The incentive is to increase the amount of intermediate and final good manufacturing, processing, and assembly done within NAFTA, when regional value content requirements are binding, at the expense of facilities in other countries that would otherwise have a comparative advantage. This distortion of the sourcing and purchasing decision causes policy-induced allocation inefficiency where firms and industries are producing goods at a higher cost even though less costly inputs are available. Krishna (2004) indicated that this provides hidden protection to suppliers within a free trade agreement.

Estevadeordal and Suominen (2004b), employing a 156-country gravity model, carried out the most extensive investigation to date on estimating the trade effects of ROO. They found that regimes with restrictive ROO and with high degrees of sectoral selectivity discourage aggregate trade flows. They also found that at the sectoral level, restrictive ROO in final goods encourage trade in intermediate goods, and could thus engender trade diversion in inputs.

What do the quantitative studies reveal about the economic costs of NAFTA ROO? Appiah (1999) incorporated NAFTA ROO into a multi-sector general equilibrium model, modelled NAFTA ROO as an RVC requirement and found, in his intermediate case, the welfare costs of NAFTA ROO to be 1.5% to 2.3% of GDP.[30] He found that the more restrictive the ROO, the more the cost in terms of forgone GDP. With non-restrictive ROO, the cost of ROO to the Canadian economy is 0.3% to 0.61% of GDP while restrictive ROO could cost the Canadian economy 2.8% of GDP. In addition, Appiah (1999) found that welfare costs of NAFTA ROO to the US economy are approximately 0.47% to 1.2% of US GDP in the intermediate case.

Cadot et al. (2002) employed data on Mexican exports to the United States, exports to the rest of the world, NAFTA preferences, the Estevadeordal restrictiveness index, and dummy variables to estimate a model explaining the effects of NAFTA ROO on Mexican exports to the United States. They found that relaxing NAFTA ROO would increase Mexican exports to the United States between 17.8% and 35%.[31] In addition, relaxing the change in tariff classification at the chapter level would increase Mexican exports by 35.3%. This suggests that NAFTA ROO significantly reduce exports from member countries.

Ghosh and Rao (2004) assessed the likely effects from a Canada-US customs union in a dynamic multi-sector, multi-country general equilibrium model. They found that eliminating NAFTA ROO alone between Canada and the United States would increase Canada's GDP by 1.04%, US GDP by 0.13%, and would increase Canadian exports to the United States by 19% and American exports to Canada by 22.7%.[32] In addition, the simulations indicate that the elimination of NAFTA ROO between the two countries would increase investment into Canada by 1.3% and the United States by 0.23%.

Examining NAFTA ROO and Bilateral Trade

In this section, we explore the relationship between NAFTA utilization rates, the Estevadeordal ROO restrictiveness index, and tariff preferences. To simplify, we can conceptually view the producer/exporter facing a two-stage problem.

In the first stage, the producer/exporter must make a sourcing and/or production decision. We can think of this sourcing and production decision when ROO are binding within the framework of the producer/exporter's profit maximization problem with the additional ROO binding constraint. The formulation of the constraint(s) is different depending on whether ROO are characterized by CTC, CTC plus RVC, or CTC plus technical requirements. The producer/exporter provides the certificates of origin to the purchaser/importer of the good.

In the second stage, the choice of using NAFTA with its compliance costs versus MFN can be thought of in the context of a cost minimization problem of the importer. If the good for importation satisfies the ROO binding constraint within stage one, the importer can choose between NAFTA and MFN status. However, not satisfying the binding ROO constraint in stage one implies that the importer is only entitled to MFN status. It is the importer that must provide the necessary documentation to customs for clearance of the imported shipment.

We separate the choice of input mix in the production decision and the sourcing problem by producers/exporters from the importers' decision to use NAFTA or MFN. For our analysis, we focus on the use of NAFTA or MFN as a means to import into a member country and abstract from the sourcing and production decision.

The importer will seek the mode of importation, NAFTA versus MFN, which minimizes the cost of importation. It is assumed the logistical costs (transportation charges, insurance, brokers' fees, etc.) are the same under NAFTA and MFN. As mentioned before, the key cost factors that influence the choice of using NAFTA versus MFN are tariff preferences and the requirements associated with ROO.

It is expected that NAFTA utilization is positively related to tariff preferences since the greater the difference between MFN and NAFTA tariffs, the greater the cost savings from not paying MFN duty net of NAFTA ROO costs if one uses NAFTA. It is also expected that NAFTA utilization is negatively related to the degree of restrictiveness of ROO so the more restrictive ROO, the less the use of NAFTA. The predominant use of the CTC at the chapter level makes it more difficult to satisfy compliance with ROO requirements compared to CTC at lower levels within the HS code and, hence, should result in lower utilization rates.

To capture the effects of ROO restrictiveness on utilization rates, we first employ the Estevadeordal restrictiveness index. The Estevadeordal index performs well in regressions with cross-country aggregate data (Estevadeordal and Suominen, 2003). With single country trade data, the index performs well with disaggregated data (Anson et al., 2003).

In addition, given the large percent of ROO requiring a chapter change, we also employ a chapter change dummy as an alternative to the restrictiveness index. Our regression strategy is to use the restrictiveness index and compare these results to our regressions where dummies capture the CTC at the chapter level as specified in Annex 401 of NAFTA. Following Cadot et al. (2002) and Carrère and de Melo (2004), we also include a sector-specific dummy variable to capture the heterogeneity within certain sectors.

Our regression equation is:

$$\ln U = \beta_0 + \beta_1 \ln \tau + \beta_2 \ln r + \delta D \qquad (2)$$

where:

τ is the tariff preference rate calculated as
$(t^{MFN} - t^{NAFTA})/(1+ t^{NAFTA})$ where t is the tariff rate
r is the Estevadeordal restrictiveness index of the i^{th} good
D is a sector dummy.

It is expected that $\beta_1 > 0$ and $\beta_2 < 0$.

Our first set of regressions, reported in Table 6, use section level data. The results show that tariff preferences are positively related to NAFTA utilization: the greater the tariff preferences (the higher the MFN rate), the greater the use of NAFTA. In all cases, tariff preferences are statistically significant. With every one percentage reduction in tariff preferences, there would be approximately one half a percentage reduction in NAFTA utilization rate as importers find it relatively less costly to use the MFN and relatively less attractive to use NAFTA.

Table 6: NAFTA Utilization Regressions

	1	2	3	4	5	6
Independent variables	Dependent Variable NAFTA Utilization Rates					
Constant	3.177* (2.336)	2.951** (15.76)	3.192* (2.126)	3.203** (17.26)	2.959** (3.245)	3.175** (19.59)
Tariff preference	0.538** (3.837)	0.578** (4.074)	0.354* (2.126)	0.391 (2.081)	0.411** (3.544)	0.405** (3.492)
Restrictiveness index	-0.159 (-0.1855)		0.016 (0.026)		0.156 (0.274)	
Section dummy	0.702* (2.336)	0.861* (2.495)	0.572* (2.177)	0.604* (2.212)	0.553* (2.327)	0.570* (2.484)
CC dummy		-0.363 (-1.024)		-0.105 (-0.382)		.099 (.533)
Country dummy					-0.078 (-0.420)	-0.076 (-0.409)
adj R^2	.57	.60	.48	.48	.44	.45
Data	US HS sections	US HS sections	Canada HS sections	Canada HS Sections	Pooled	Pooled

Notes:
t-ratio in parenthesis.
* and ** denotes significance at the 5% and 1% level, respectively.

The Estevadeordal restrictiveness index is not statistically significant. This is not surprising given the data sets we are using for these regressions. As a result, we replace the restrictiveness index with a restrictiveness dummy following Carrère and de Melo (2004). For our second regression equation, we replace the Estevadeordal index with a restrictiveness dummy (CC dummy), which takes on the value of 1 when $r \geq 6$ and 0 otherwise. The results indicate that the restrictiveness dummy has the correct sign suggesting CTC[33] at the chapter level reduces NAFTA utilization. However, the coefficient is not statistically significant. The section dummy captures the effects of selected sections on NAFTA utilization and is positive and statistically significant.

Running the regressions with pooled Canada-US bilateral trade data reveals no change in the value of the estimated parameters compared to the single country analysis (see columns 5 and 6). Again, the restrictiveness index and the change in chapter dummy are not statistically significant. It is interesting to note the country dummy is not statistically significant suggesting similar behaviour in both countries. This would suggest that composition differences may explain the sectoral differences in utilization between the two countries.

We take an initial look at 2002 data for US imports from Canada at the chapter level. Although there are 99 chapters designated, chapter 77 is reserved for future use while 98 and 99 are reserved for special use. Consequently, the chapter data allow for 96 observations. Inspecting the chapter data, we observe the dependent variable, NAFTA utilization rates U_i, with values $0 \leq U_i < 1$.[34] With a dependent variable that is zero for a significant fraction of the observations, conventional regressions fail to account for the qualitative difference between limit (zero) observations and non-limit (continuous) observations.[35] If we only use the observations where $U_i > 0$ to estimate the regression equation by ordinary least squares, then the mean stochastic error would not equal zero violating the first assumption of the classical linear model. Therefore, we estimate the coefficients using the Tobit regression model applied to the HS chapter import data set.

These disaggregated data allow us to expand the range of dummy variables in an attempt to capture the effects of NAFTA ROO on utilization rates. Our strategy will be to run our first regression with the Estevadeordal restrictiveness index and then a second regression with the change in chapter dummy variable, reflecting the value of 1 when r $\geq$ 6 and CC dummy = 0 otherwise. Our third regression includes three restrictiveness dummies: CC dummy for chapter changes, CHplus dummy for heading changes including a RVC requirement and a technical requirement, and CH dummy for changes in headings. The results are reported in Table 7.

Tariff preferences and the sector dummy are statistically significant and hence NAFTA utilization rates are positively related to tariff preference in all three regressions. We find that the restrictiveness index has the right sign but is not statistically significant. Similarly, none of the changes in the tariff classification dummies are significant in regressions 8 and 9.

Table 7: NAFTA Utilization Regressions			
	7	8	9
Independent variables	Dependent Variable NAFTA Utilization Rates		
Constant	2.10** (2.785)	2.727** (7.302)	2.237** (4.240)
Tariff preference	0.308** (3.837)	0.307** (3.751)	0.308** (3.743)
Restrictiveness index	-0.123 (-0.1855)		
Sector dummy	1.419** (4.678)	1.443** (4.775)	1.390** (4.538)
CC dummy		0.085 (0.389)	0.584 (1.322)
Chplus dummy			0.505 (1.181)
CH dummy			.571 (1.344)
Notes: Data: USITC chapter import data for 2002, Estevadeordal index aggregated to the HS two-digit chapter level, 96 observations. Coefficients estimated with the Tobit model. t-ratio in parenthesis. ** denotes significance at the 1% level.			

The empirical results regarding the restrictiveness index and the CTC dummies are not surprising given the level of aggregation in the data. The influence of the restrictiveness index on utilization rates should show up with the single country trade data at the import transaction level, the item level, and the subheading level. Anson et al. (2003) and Cadot et al. (2002) statistically found the inverse relationship between NAFTA utilization rates and the restrictiveness index employing subheading data on US imports from Mexico.

Similarly, the effects of the CTC dummies on utilization are more likely to be captured in the econometric results with a greater degree of disaggregation. Carrère and de Melo (2004), using HS six-digit data for US imports from Mexico, found the CTC dummies to be highly significant. These micro data also allowed them to explore how the stages of production (intermediate and final goods) influence utilization rates and the cost of compliance.

Does ROO Reduce US NAFTA Imports from Canada?

In this section, we rely on the 2003 HS six-digit data for imports into the United States from Canada in our regressions.[36] These data pose some challenges given the large number of sub-headings where NAFTA utilization rates are zero or 100%. There are 1,492 subheading observations where NAFTA utilization rate is zero and 743 subheading observations where the NAFTA utilization rate is 100%.

The restrictiveness index was updated to incorporate the various changes in NAFTA ROO that have occurred since 1998.

We choose to estimate our model using a two-limit Tobit model. This approach allows us to use the entire sample including observations where the dependent variable, NAFTA utilization rate, may take on values of zero, one, or any value in between.

Our regression equation is:

$$U = \beta_0 + \beta_1 \tau + \beta_2 r + \beta_3 F + \delta_1 D_1 + \delta_2 D_2 + \delta_3 D_3 + \ldots + \delta_n D_n$$

where:

τ is the tariff preference rate calculated as
$(t^{MFN} - t^{NAFTA})/(1 + t^{NAFTA})$ where t is the tariff rate,
r is the Estevadeordal restrictiveness index, and
D_i are section dummy variables representing 19 sections.[37]

Again, it is expected that the greater the tariff preference, the greater the use of NAFTA ($\beta_1 > 0$), and the more restrictive ROO, the less the use of NAFTA ($\beta_2 < 0$). The section dummies should pick up the extent to which NAFTA is used more or less than average after correcting for the influence of the restrictiveness index, tariff preferences, and freight and insurance charges.

The results are shown in Table 8. The coefficients associated with tariff preferences and the restrictiveness index are statistically significant and have the expected signs. Nine dummies are significant at the 1% level of confidence while an additional two section dummies are significant at the 5% level.

Section 2 (vegetable products), section 3 (fats and oils), section 4 (food, beverages and tobacco), section 7 (plastics), section 11 (textiles and textile articles) and section 15 (base metals) all reflect greater NAFTA utilization after correcting for the influence of the restrictiveness index, tariff preferences, and freight and insurance charges.[38] On the other hand, section 5 (mineral products), section 9 (wood and articles of wood), and section 16 (machinery and mechanical appliances) have statistically smaller utilization rates after correcting for the restrictiveness index, tariff preferences, and freight and insurance charges compared to the average section.

Table 8: Determinants of NAFTA Utilization			
Independent variables		Independent variables (continued)	
Intercept	0.6720** (6.78)	D9	-0.3973** (-3.35)
Restrictiveness index	-0.0784** (-6.48)	D10	0.0651 (0.68)
Tariff preference	0.0194** (7.69)	D11	0.6537** (8.40)
D1	-0.0555 (-0.60)	D12	0.1162 (0.90)
D2	0.4759** (5.27)	D13	0.2008* (2.05)
D3	0.6723** (4.64)	D14	-0.0695 (-0.50)
D4	0.4467** (4.84)	D15	0.4263** (5.41)
D5	-0.7943** (-6.68)	D16	-0.2718** (-3.41)
D6	0.0861 (1.02)	D17	-0.0911 (-0.89)
D7	0.3331** (3.77)	D18	-0.0526 (-0.58)
D8	0.2531* (2.16)	D19	-0.2860 (-1.39)
		Observations Log likelihood	4489 -4385

Notes:
Coefficients estimated with two-limit Tobit.
T-ratios in brackets.
** and * denotes 1% and 5% level of significance.
Source: USITC trade data for 2003.

To assist in understanding these parameter estimates, we undertake the following conceptual experiments of hypothetically decreasing:

- the average restrictiveness index from 5 to 4; and
- the average tariff preference by one percentage point.

These are done separately and the impact on NAFTA utilization examined.[39] Reducing the average NAFTA ROO restrictiveness index from 5 to 4 would result in a 13% increase in the use of NAFTA. This is equivalent to relaxing NAFTA ROO to the point where the average NAFTA ROO would be a change in tariff classification at the heading level and would be equivalent to the ROO restrictiveness level of the Canada-Israel Free Trade Agreement. Similarly, redrafting NAFTA ROO so the average restrictiveness index fell to 3 would result in a 26% increase in NAFTA exports from Canada to the United States.

Reducing tariff preferences by one percentage point would decrease NAFTA utilization by 3.4%. As MFN rates fall, this makes the use of MFN more attractive. Our results indicate that reducing the restrictiveness of NAFTA ROO would bring about considerably larger increases in NAFTA imports compared to reducing MFN tariffs.

These results are consistent with the general message of Ghosh and Rao (2004) who found that the gain from the reduction in NAFTA ROO was significantly larger than the gain from tariff harmonization.

The econometric results confirm our earlier expectations that the restrictiveness of NAFTA ROO has dampened the use of NAFTA, while the remaining MFN rates have encouraged the use of NAFTA.

7. Concluding Remarks

For Canada and the United States, improved economic access to each other's market has been beneficial. The security concerns in the wake of September 11th have made Canadians acutely aware of the strategic importance of the border and introduced new issues that must be resolved to facilitate the movement of goods and individuals between Canada and the United States. One proposed policy option to enhance economic integration between Canada and the United States is the elimination of NAFTA ROO by moving toward a Canada-US customs union on an economy wide or sectoral basis.

The available empirical evidence suggests that NAFTA ROO, although intended to distinguish between NAFTA originating goods and non-originating goods, can result in significant unexpected economic costs that alter the expected net benefits from trade. Importers use NAFTA less than expected given that NAFTA utilization is around 50% of Canada-US bilateral trade. Utilization of NAFTA for US imports from Canada peaked in 1998 and has declined since then. About half of Canada-US trade is imported under NAFTA, while almost all tariff lines under NAFTA are duty free. When MFN rates are zero, importers use NAFTA only to a very limited extent likely as a result of the costs of using NAFTA; when MFN rates are positive, importers rely more heavily on NAFTA.

Other studies based on US imports from Mexico data indicated that NAFTA ROO are costly. Our analysis suggests that NAFTA compliance costs for US imports from Canada are equal to about 1% of the value of exports. In addition, Anson et al. (2003), Cadot et al. (2002), and Carrère and de Melo (2004) have demonstrated that NAFTA ROO have significant negative effects on NAFTA utilization rates for US imports from Mexico. For US imports from Canada, NAFTA ROO significantly reduce NAFTA utilization rates.

The maturity of the bilateral trade relationship between Canada and the United States as reflected in the success of the Auto Pact, FTA, and NAFTA coupled with liberalized tariff environments witnessed by the historical reductions of Canadian MFN and US MFN/NTR tariff rates over the last 15 years, may be eroding the usefulness of NAFTA as demonstrated by declining NAFTA utilization rates on both sides of the northern border. If we want to capture additional gains from trade, reduce inefficient and costly sourcing

and production, and reduce compliance and administration costs associated with NAFTA ROO, then action is required.

Several approaches could be employed to address the adverse effects of ROO. The elimination of ROO for all intra-bloc trade between Canada and the United States could occur by moving toward a Canada-United States customs union. Alternatively, ROO could be eliminated for intra-bloc trade on a sectoral basis where the difference in level of MFN between the two countries is small or zero. Some have suggested this as a potential option where the inter-country differences in tariffs are less than one percentage point. Our earlier work on a potential customs union suggested that the relative small differences in the external tariff between Canada and the United States for non-agriculture would make a sectoral approach toward the removal of NAFTA ROO attractive. Sensitive sectors, such as automotives, agriculture, and textiles may require special consideration. Reducing MFN rates could also eliminate some adverse effects of NAFTA ROO. As MFN rates decline, importers move from using NAFTA toward using MFN.

At a minimum, NAFTA rules of origin should be liberalized to make it easier, less costly, and less burdensome for firms to establish origin, to comply with ROO, and use NAFTA. Although there are numerous options and variations to be considered in liberalizing NAFTA ROO, we explore three possible options below.

The first option to liberalize NAFTA ROO is to reduce the current regional value content threshold of 60% if calculated by the transaction value method or 50% if calculated by the net cost method. Lowering the RVC threshold would allow greater choice in sourcing inputs, reduce ROO-induced inefficiency in production and reduce some of the barriers to trade caused by NAFTA ROO. Moreover, reducing the RVC threshold would be relatively simple to implement and would involve minimal transaction costs. Currently, 35% of the tariff items have an RVC component.

Under the Canada-Chile Free Trade Agreement, the RVC is 25% (net cost method) and 35% (transaction value method), and for the Mexico-Israel Free Trade Agreement the RVC is 35% (net cost method) and 45% (transaction value method). The United States bilateral agreements with Israel and Jordan diverge markedly from NAFTA model, operating with only RVC rules. The RVC threshold is 35% in both agreements. The application of a single test across all activities and the relatively low RVC requirement would be reflected in a lower restrictiveness index.

A second option to reduce the restrictiveness of NAFTA ROO is to diminish the discriminatory nature of NAFTA CTC rules by downward harmonization. Estevadeordal (2000), Estevadeordal and Suominen (2004a,b), and the Australia Productivity Commission (2004a,b) identified the CTC ROO at the chapter level as a major cause of the restrictiveness of NAFTA ROO. The incidence of CTC ROO at the chapter level in the first test is significantly lower in the United States-Singapore Free Trade Agreement at 33% and the United States-Chile Free Trade Agreement at 37% compared to NAFTA at 54%.[40] Downward harmonization of NAFTA CTC rules would require the modification of those CTC rules at the chapter (and perhaps heading) level downward to CTC at the

heading (or subheading) level. Again, this option would reduce the policy-induced inefficiencies created by the current NAFTA ROO.

A third option is to simplify the second rule or test for the same tariff item. As outlined earlier, a choice of rules is given for a wide range of tariff items. In NAFTA, the first test is commonly based on a CTC rule alone, while a second test, for the same tariff item, may involve a CTC rule at a lower level, together with a technical test and/or RVC requirement. For any tariff item where a choice of rules is given, simplification could involve a CTC for rule one and an RVC only for rule two.

These options could be implemented independently or combined as a NAFTA ROO reform package.

It should be noted that RVC threshold reduction, downward harmonization of CTC, and the simplification of the second rule would all generate efficiency gains to the economy and benefits to producers and traders. However, these options would not address, to any large extent, the compliance and administration costs associated with NAFTA ROO. A review of NAFTA ROO transaction requirements for customs purposes, and business and customs operational procedures to meet NAFTA ROO is required to identify any potential sources of administrative and compliance gains.

In conclusion, our present analysis suggests that NAFTA ROO are restrictive, create policy-induced inefficiencies in sourcing and production, impose compliance costs on firms engaged in intra-NAFTA trade, and inhibit NAFTA trade. The elimination or reduction of these costs associated with NAFTA ROO would provide positive economic benefits to Canada by lowering costs to producers and prices to consumers, by increasing intra-NAFTA trade and by reducing NAFTA ROO-induced inefficiencies.

Notes

[1] Some authors have examined the available empirical evidence; for example, see Harris (2001, 2003) and Goldfarb (2003a).

[2] This paper is part of a larger research project, Moving Toward a Customs Union, involving research partners from Industry Canada, International Trade Canada, Statistics Canada, the Department of Finance Canada, and the Policy Research Initiative.

[3] The World Trade Organization (WTO) agreement on ROO aims at harmonizing non-preferential rules of origin so all WTO members apply the same criteria, ensuring that these rules do not create unnecessary obstacles to trade. The agreement sets out a work program for the harmonization of these rules to be undertaken by the WTO in conjunction with the World Customs Organization, an independent intergovernmental organization with over 150 member countries based in Brussels, Belgium.

[4] For this requirement, each non-originating material used in the production of the good undergoes an applicable change in tariff classification set out in Annex 401 as a result of production occurring entirely in the territory of one or more of the parties, or the good otherwise satisfies the applicable requirements of that annex where no change in tariff classification is required, and the good satisfies all other applicable requirements of this chapter.

[5] Article 401 (d) applies when the good is produced entirely in one or more of the NAFTA countries, but one or more of the non-originating materials provided for as parts under the HS that are used in the production of the good do not undergo a change in tariff classification for either of two particular reasons, and provided the good meets the regional value content criteria as outlined in Article 402.

[6] The HS was developed and is maintained by the World Customs Organization. Over 170 countries, representing about 98% of world trade, use the HS as a basis for trade negotiations, collecting international trade statistics, quota controls, rules of origin, and statistical and economic research and analysis.

[7] The RVC may be calculated using one of two methods: transaction value or net cost. Usually, the exporter or producer can choose between either method. However, in a number of situations, the exporter or producer cannot use the transaction value method. The producer can also revert to the net cost method if using the transaction value method is unfavourable.

[8] The net cost method calculates the RVC as a percentage of the net cost to produce the good while the transaction value method calculates the value of the non-originating materials as a percentage of the GATT transaction value of the good. Because the transaction value method permits the producer to count all its costs and profit as originating, the required percentage of RVC under this method is higher than under the net cost method.

[9] Canada and the United States are implementing an integrated approach to improve security and facilitate trade through away-from-the-border processing for truck/rail cargo (and crews), including inland pre-clearance/post-clearance, international zones and pre-processing centres at the border, and maritime port intransit pre-clearance as outlined in the 30-point action plan, announced in conjunction with the Smart Border Declaration.

[10] Officials from Canadian Border Services pointed this out to the authors.

[11] Cadot et al. (2002) and Carrère and de Melo (2004) used the terminology, administrative and distortionary cost, as components of the trade compliance cost. We follow the APC (2004a,b) use of terminology.

[12] This applies to individual importers where the NAFTA tariff rate is zero. For 2002 data, almost 100% of NAFTA rates were duty free.

[13] See next section on Estevadeordal restrictiveness index.

[14] Carrère and de Melo (2004) follow Cadot et al. (2002) using the term "administrative costs" to the firm to refer to compliance costs.

[15] There are 68 observations meeting the requirement that $95\% \leq u < 100$ and $r \leq 2$. We eliminate one observation since this outlier has an abnormally high effective tariff rate and is not representative of the trade cost within this group. With all 68 observations the compliance costs are estimated at 0.83% of the price of US imports from Canada.

[16] The ROO can be restrictive in terms of the difficulty to meet the ROO criteria or restrictive in their effects on trade or utilization of the preferential trade agreement.

[17] This table is a simplification of the table found in Estevadeordal and Suominen (2004b).

[18] We have updated the Estevadeordal index at the six-digit level to incorporate the changes made to NAFTA ROO up until January 2003.

[19] The EFTA comprises Iceland, Liechtenstein, Norway, and Switzerland.

[20] See Estevadeordal and Suominen (2004a).

[21] By choosing MFN, however, the importer must incur the merchandise processing fee.

[22] The WTO (2004) indicated the remaining 1% fell under a variety of programs, such as civil aviation and pharmaceuticals.

[23] The United States adopted the term Normal Trade Relations (NTR) status replacing most-favoured-nation status in 1998. We use the term MFN/NTR.

[24] NAFTA utilization rate is based on the average of section rates, the most common rate reported, provides a biased estimate of the actual NAFTA utilization rate when compared to the overall NAFTA utilization rate based on HS six-digit data. The former is calculated as the average of the 20 or 21 section utilization rates while the overall NAFTA utilization, for example for imports into Canada from the United States, is calculated as the total value of imports using NAFTA status from the United States divided by total value of imports into Canada from the United States. The overall utilization rate can be viewed as a trade weighted measure of utilization.

[25] In the remainder of this section, we use NAFTA when referring to either NAFTA or its predecessor, the FTA.

[26] In figure 4, non-NAFTA imports include MFN imports and other imports from Canada related to trade programs including the Auto Pact, Civil Aircraft, Pharmaceuticals, and Dyes. These programs were phased out by 1998.

[27] We use 1992 to 2003 data only for Canadian imports from the United States provided by Statistics Canada.

[28] Additional sub-heading analysis is provided in Appendix 4.

[29] See Australia Productivity Commission (2004b), Krishna (2004), Krueger (1993, 1997, 1999), and Estevadeordal and Suominen (2004a).

[30] Appiah (1999) modelled NAFTA ROO as changes in the tariff classification and as RVC requirements. The change in tariff classification is approximated by the percentage increase in value added per unit of foreign inputs to achieve the tariff classification change. His intermediate case simulates a change in tariff classification (tariff shift) equal to 30% in value added per unit cost of foreign input. Two other simulations are a tariff shift of 20% and 40% in value added per unit cost of foreign input.

[31] Cadot et al. (2002) found that relaxing ROO to r = 3 would increase Mexican exports to the United States by 17.8%, but setting it to r = 2 would increase exports by 35%.

[32] Ghosh and Rao (2004) provided upper-bound estimates and denoted the maximum values that may occur. These are preliminary results and are subject to subsequent modification.

[33] We use the notation CC to denote a change at the chapter level, CH to indicate a change in heading; CS to represent a change in subheading and CI to designate a change in tariff classification at the item level.

[34] There is no HS chapter with a NAFTA utilization rate of 1.

[35] Greene (1990) provided an in-depth explanation of several limited dependent variable models.

[36] We do not use the data for Canadian imports from the United States since the Canadian data contain noise in the tariff revenue component that may bias the econometric results.

[37] See Appendix 1 for a listing of chapters and sections. Section 21 has been eliminated from the data set since there are no index numbers assigned to this section.

[38] Each of these sections has a dummy coefficient that is statistically significant at the 1% level.

[39] We calculate the relevant elasticity evaluated at the mean of the data and simulate the effects of each scenario based in these elasticities.

[40] See Estevadeordal and Suiminon (2004b) or the Australia Productivity Commission (2004b).

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Appendix 1: HS Sections and Chapters

SECTION I Live Animals; Animal Products (Chapters 01-05)

Chapter
1 Live Animals
2 Meat and Edible Meat Offal
3 Fish and Crustaceans, Molluscs and Other Aquatic Invertebrates
4 Dairy Produce: Birds' Eggs; Natural Honey; Edible Products of Animal Origin, Not Elsewhere Specified or Included.
5 Products of Animal Origin, Not Elsewhere Specified or Included

SECTION II Vegetable Products (Chapters 6-14)

Chapter
6 Live Trees and Other Plants; Bulbs, Roots and the Like; Cut Flowers and Ornamental Foliage.
7 Edible Vegetables and Certain Roots and Tubers
8 Edible Fruit and Nuts; Peel of Citrus Fruit or Melons
9 Coffee, Tea, Mate and Spices
10 Cereals
11 Products of the Milling Industry; Malt; Starches; Inulin; Wheat Gluten
12 Oil Seeds and Oleaginous Fruits; Misc. Grains, Seeds and Fruit; Industrial or Medicinal Plants; Straw and Fodder
13 Lac; Gums Resins and Other Vegetable Saps and Extracts
14 Vegetable Plaiting Materials; Vegetable Products not Elsewhere Specified or Included

SECTION III Animal or Vegetable Fats and Oils and Their Cleavage Products; Prepared Edible Fats; Animal or Vegetable Waxes (Chapter 15)

Chapter
15 Animal or Vegetable Fats and Oils and Their Cleavage Products; Prepared Edible Fats; Animal or Vegetable Waxes

SECTION IV Prepared Foodstuffs; Beverages, Spirits, and Vinegar; Tobacco and Manufactured Tobacco Substitutes (Chapters 16-24)

Chapter
16 Preparations of Meat, of Fish or of Crustaceans, Molluscs or Other Aquatic Invertebrates
17 Sugars and Sugar Confectionery
18 Cocoa and Cocoa Preparations
19 Preparations of Cereals, Flour, Starch or Milk; Pastry Cooks' Products
20 Preparations of Vegetables, Fruit, Nuts or Other Parts of Plants
21 Misc. Edible Preparations
22 Beverages, Spirits and Vinegar
23 Residues and Waste From the Food Industries; Prepared Animal Fodder
24 Tobacco and Manufactured Tobacco Substitutes

SECTION V Mineral Products (Chapters 25-27)

Chapter
25 Salt, Sulphur, Earths and Stone; Plastering Materials, Lime and Cement
26 Ores, Slag and Ash
27 Mineral Fuels, Mineral Oils and Products or Their Distillation; Bituminous Substances; Mineral Waxes

SECTION VI Products of the Chemical or Allied Industries (Chapters 28-38)

Chapter
28 Inorganic Chemicals; Organic or Inorganic Compounds of Precious Metals, of Rare-earth Metals, of Radioactive Elements or of Isotopes
29 Organic Chemicals
30 Pharmaceutical Products
31 Fertilisers
32 Tanning or Dyeing Extracts; Tannins and Their Derivatives; Dyes, Pigments Other Colouring Matter; Paints and Varnishes; Putty and Other Mastics; Inks
33 Essential Oils and Resinoids; Perfumery, Cosmetic or Toilet Preparations
34 Soap, Organic Surface-active Agents, Washing Preparations, Lubricating Preparations, Artificial Waxes, Prepared Waxes, Polishing or Scouring Preparations, Candles and Similar Articles, Modelling Pastes, "Dental Waxes" and Dental Preparations with a Basis of Plaster
35 Albuminoidal Substances; Modified Starches; Glues; Enzymes
Explosives; Pyrotechnic Products; Matches; Pyrophoric Alloys; Certain Combustible Preparations
Photographic or Cinematographic Goods
Misc. Chemical Products

SECTION VII Plastics and Articles Thereof; Rubber and Articles Thereof (Chapters 39-40)

Chapter
36 Plastics and Articles Thereof
37 Rubber and Articles Thereof

SECTION VIII Raw Hides and Skins, Leather, Furskins and Articles Thereof; Saddlery and Harness; Travel Goods, Handbags, and Similar Containers;Articles of Animal Gut (Other Than Silkworm Gut) (Chapters 41-43)

Chapter
41 Raw Hides and Skins (Other Than Furskins) and Leather
42 Articles of Leather; Saddlery and Harness; Travel Goods, Handbags and Similar Containers; Articles of Animal Gut (Other Than Silkworm Gut)
43 Furskins and Artificial Fur; Manufactures Thereof

SECTION IX Wood and Articles of Wood; Wood Charcoal; Cork and Articles of Cork, Manufactures of Straw, of Esparto or of Other Plaiting Materials; Basketware and Wickerwork (Chapters 44-46)

Chapter
44 Wood and Articles of Wood; Wood Charcoal
45 Cork and Articles of Cork
46 Manufactures of Straw, of Esparto or of Other Plaiting Materials; Basketware and Wickerwork

SECTION X Pulp of Wood or of Other Fibrous Cellulosic Material; Waste and Scrap of Paper or Paperboard; Paper and Paperboard and Articles Thereof (Chapters 47-49)

Chapter
47 Pulp of Wood or Other Fibrous Cellulosic Material; Waster and Scrap of Paper or Paperboard
48 Paper and Paperboard; Articles of Paper Pulp, of Paper or of Paperboard
49 Printed Books, Newspapers, Pictures and Other Products of the Printing Industry; Manuscripts, Typescripts and Plans

SECTION XI Textiles and Textile Articles (Chapters 50-63)

Chapter
50 Silk
51 Wool, Fine or Coarse Animal Hair; Horsehair Yam and Woven Fabric
52 Cotton
53 Other Vegetable Textile Fibres; Paper Yarn and Woven Fabrics of Paper Yarn
54 Man-made Filaments
55 Man-made Staple Fibres
56 Wadding, Felt and Nonwovens; Special Yarns; Twine, Cordage, Ropes and Cables and Articles Thereof
57 Carpets and Other Textile Floor Coverings
58 Special Woven Fabrics; Tufted Textile Fabrics; Lace; Tapestries; Trimmings; Embroidery
59 Impregnated, Coated, Covered or Laminated Textile Fabrics, Textiles Articles of a Kind Suitable for Industrial Use
60 Knitted or Crocheted Fabrics
61 Articles of Apparel and Clothing Accessories, Knitted or Crocheted
62 Articles of Apparel and Clothing Accessories, Not Knitted or Crocheted
63 Other Made Up Textile Articles, Sets; Worn Clothing and Worn Textile Articles; Rags

SECTION XII Footwear, Headgear, Umbrellas, Sun Umbrellas, Walking-Sticks, Seat-Sticks, Whips, Riding-Crops and Parts Thereof; Prepared Feathers and Articles Made Therewith; Artificial Flowers; Articles of Human Hair (Chapters 64-67)

Chapter
64 Footwear, Gaiters and the Like; Parts of Such Articles
65 Headgear and Parts Thereof
66 Umbrellas, Sun Umbrellas, Walking-sticks, Seat-sticks, Whips, Riding-crops and Parts Thereof
67 Prepared Feathers and Down and Articles Made of Feathers or of Down; Artificial Flowers; Articles of Human Hair

SECTION XIII Articles of Stone, Plaster, Cement, Asbestos, Mica or Similar Materials; Ceramic Products; Glass and Glassware (Chapters 68-70)

Chapter
68 Articles of Stone, Plaster, Cement, Asbestos, Mica or Similar Materials
69 Ceramic Products
70 Glass and Glassware

SECTION XIV Natural or Cultured Pearls, Precious or Semiprecious Stones, Precious Metals, Metals Clad with Precious Metal, and Articles Thereof; Imitation Jewellery; Coin (Chapter 71)

Chapter
71 Natural or Cultured Pearls, Precious or Semi-precious Stones, Precious Metals, Metals Clad with Precious Metal, and Articles Thereof: Imitation Jewellery; Coin

SECTION XV Base Metals and Articles of Base Metal (Chapters 72-83)

Chapter
72 Iron and Steel
73 Articles of Iron or Steel
74 Copper and Articles of Thereof
75 Nickel and Articles Thereof
76 Aluminum and Articles Thereof
78 Lead and Articles Thereof
79 Zinc and Articles Thereof
80 Tin and Articles Thereof
81 Other Base Metals; Cermets; Articles Thereof
82 Tools, Implements, Cutlery, Spoons, and Forks, of Base Metal; Parts Thereof of Base Metal
83 Misc. Articles of Base Metal

SECTION XVI Machinery and Mechanical Appliances; Electrical Equipment; Parts Thereof; Sound Recorders and Reproducers, Television Image and Sound Recorders and Reproducers, and Parts and Accessories of Such Articles (Chapters 84-85)

Chapter
84 Nuclear Reactors, Boilers, Machinery and Mechanical Appliances; Parts Thereof
85 Electrical Machinery and Equipment and Parts Thereof Sound Recorders and Reproducers, TV Image and Sound Recorders and Reproducers, and Parts and Accessories of Such Articles

SECTION XVII Vehicles, Aircraft, Vessels and Associated Transport Equipment (Chapters 86-89)

Chapter
86 Railway or Tramway Locomotives, Rolling-stock and Parts Thereof; Railway or Tramway Track Fixtures and Fittings and Parts Thereof; Mechanical (Including electro-mechanical) traffic signalling equipment of all kinds.
87 Vehicles Other Than Railway or Tramway Rolling-stock, and Parts and Accessories Thereof
88 Aircraft, Spacecraft and Parts Thereof
89 Ships, Boats and Floating Structures.

SECTION XVIII Optical, Photographic, Cinematographic, Measuring, Checking, Precision, Medical or Surgical Instruments and Apparatus; Clocks and Watches; Musical Instruments; Parts and Accessories Thereof (Chapters 90-92)

Chapter
90 Optical, Photographic, Cinematographic, Measuring, Checking, Precision, Medical or Surgical Instruments and Apparatus; Parts and Accessories Thereof
91 Clocks and Watches and Parts Thereof
92 Musical Instruments; Parts and Accessories of Such Articles

SECTION XIX Arms and Ammunition; Parts and Accessories Thereof (Chapter 93)

Chapter
93 Arms and Ammunition; Parts and Accessories Thereof

SECTION XX Miscellaneous Manufactured Articles (Chapters 94-99)

Chapter
94 Furniture; Bedding; Mattress; Mattress Supports, Cushions and Similar Stuffed Furnishings; Lamps and Lighting Fittings, Not Elsewhere Specified or Included; Illuminated Signs, Illuminated Name-plates and the Like; Prefabricated Buildings
95 Toys, Games and Sports Requisites; Parts and Accessories Thereof
96 Misc. Manufactured Articles

SECTION XXI Works of Art, Collectors' Pieces and Antiques (Chapters 97-99)

Chapter
97 Works of Art, Collectors' Pieces and Antiques
98 Reserved for Special Use by Contracting Parties
99 Reserved for Special Use by Contracting Parties

Appendix 2: NAFTA Certificate of Origin

Revenue Canada Revenu Canada

PROTECTED (When Completed)

NORTH AMERICAN FREE TRADE AGREEMENT

CERTIFICATE OF ORIGIN

(Instructions Attached)

Please print or type

1 Exporter's Name and Address:

Tax Identification Number: ▶

2 Blanket Period:

From DD MM YY To DD MM YY

3 Producer's Name and Address:

Tax Identification Number: ▶

4 Importer's Name and Address:

Tax Identification Number: ▶

5 Description of Good(s)	**6** HS tariff Classification Number	**7** Preference Criterion	**8** Producer	**9** Net Cost	**10** Country of Origin

11 **I certify that:**

- **the information on this document is true and accurate and I assume the responsibility for proving such representations. I understand that I am liable for any false statements or material omissions made on or in connection with this document;**
- **I agree to maintain, and present upon request, documentation necessary to support this Certificate, and to inform, in writing, all persons to whom the Certificate was given of any changes that would affect the accuracy or validity of this Certificate;**
- **the goods originated in the territory of one or more of the Parties, and comply with the origin requirements specified for those goods in the North American Free Trade Agreement, and unless specifically exempted in Article 411 or Annex 401, there has been no further production or any other operation outside the territories of the Parties; and**
- **this Certificate consists of pages, including all attachments.**

Authorized Signature:	Company:
Name:	Title:
Date: DD MM YY	Telephone: / Fax:

NORTH AMERICAN FREE TRADE AGREEMENT
CERTIFICATE OF ORIGIN INSTRUCTIONS

For purposes of obtaining preferential tariff treatment, this document must be completed legibly and in full by the exporter and be in the possession of the importer at the time the declaration is made. This document may also be completed voluntarily by the producer for use by the exporter. Please print or type.

Field 1: State the full legal name, address (including country) and legal tax identification number of the exporter. Legal tax identification number is: in Canada, employer number or importer/exporter number assigned by Revenue Canada; in Mexico, federal taxpayer's registry number (RFC); and the United States, employer's identification number or Social Security Number.

Field 2: Complete field if the Certificate covers multiple shipments of identical goods as described in Field 5 that are imported into a NAFTA country for a specified period of up to one year (blanket period). "FROM" is the date upon which the Certificate becomes applicable to the good covered by the blanket Certificate (it may be prior to the date of signing this Certificate). "TO" is the date upon which the blanket period expires. The importation of a good for which preferential tariff treatment is claimed based on this Certificate must occur between these dates.

Field 3: State the full legal name, address (including country) and legal tax identification number, as defined in Field 1, of the producer. If more than one producer's good is included on the Certificate, attach a list of the additional producers, including the legal name, address (including country) and legal tax identification number, cross referenced to the good described in Field 5. If you wish this information to be confidential, it is acceptable to state "Available to Customs upon request". If the producer and the exporter are the same, complete field with "SAME". If the producer is unknown, it is acceptable to state "UNKNOWN".

Field 4: State the full legal name, address (including country) and legal tax identification number, as defined in Field 1, of the importer. If importer is not known, state "UNKNOWN", if multiple importers, state "VARIOUS".

Field 5: Provide a full description of each good. The description should be sufficient to relate it to the invoice description and to the Harmonized System (HS) description of the good. If the Certificate covers a single shipment of a good, include the invoice number as shown on the commercial invoice. If not known, indicate another unique reference number, such as the shipping order number.

Field 6: For each good described in Field 5, identify the HS tariff classification to six digits. If the good is subject to a specific rule of origin in Annex 401 that requires eight digits, identify to eight digits, using the HS tariff classification of the country into whose territory the good is imported.

Field 7: For each good described in Field 5, state which criterion (A through F) is applicable. The rules of origin are contained in Chapter Four and Annex 401. Additional rules are described in Annex 703.2 (certain agricultural goods), Annex 300-B, Appendix 6A (certain textile goods) and Annex 308.1 (certain automatic data processing goods and their parts). **Note: In order to be entitled to preferential tariff treatment, each good must meet at least one of the criteria below.**

Preference Criteria

A The good is "wholly obtained or produced entirely" in the territory of one or more of the NAFTA countries, as referred to in Article 415. Note: The purchase of a good in the territory does not necessarily render it "wholly obtained or produced". If the good is an agricultural good, see also criterion F and Annex 703.2. (Reference: Article 401(a) and 415)

B The good is produced entirely in the territory of one or more of the NAFTA countries and satisfies the specific rule of origin, set out in Annex 401, that applies to its tariff classification. The rule may include a tariff classification change, regional value-content requirement or a combination thereof. The good must also satisfy all other applicable requirements of Chapter Four. If the good is an agricultural good, see also criterion F and Annex 703.2. (Reference: Article 401(b))

C The good is produced entirely in the territory of one or more of the NAFTA countries exclusively from originating materials. Under this criterion, one or more of the materials may not fall within the definition of "wholly produced or obtained", as set out in Article 415. All materials used in the production of the good must qualify as "originating" by meeting the rules of Article 401(a) through (d). If the good is an agricultural good, see also criterion F and Annex 703.2. (Reference: Article 401(c))

D Goods are produced in the territory of one or more of the NAFTA countries but do not meet the applicable rule of origin, set out in Annex 401, because certain non-originating materials do not undergo the required change in tariff classification. The goods do nonetheless meet the regional value-content requirement specified in Article 401(d). This criterion is limited to the following two circumstances:

1. the good was imported into the territory of a NAFTA country in an unassembled or disassembled form but was classified as an assembled good, pursuant to HS General Rule of Interpretation 2(a); or

2. the good incorporated one or more non-originating materials, provided for as parts under the HS, which could not undergo a change in tariff classification because the heading provided for both the good and its parts and was not further subdivided into subheadings, or the subheading provided for both the good and its parts and was not further subdivided.

Note: This criterion does not apply to Chapters 61 through 63 of the HS (Reference: Article 401(d))

E Certain automatic data processing goods and their parts, specified in Annex 308.1, that do not originate in the territory are considered originating upon importation into the territory of a NAFTA country from the territory of another NAFTA country when the Most-Favoured-Nation Tariff rate of the good conforms to the rate established in Annex 308.1 and is common to all NAFTA countries. (Reference: Annex 308.1)

F The good is an originating agricultural good under preference criterion A, B or C above and is not subject to a quantitative restriction in the importing NIFTY country because it is a "qualifying good" as defined in Annex 703.2, Section A or B (please specify). A good listed in Appendix 703.BB.7 is also exempt from quantitative restrictions and is eligible for NIFTY preferential tariff treatment if it meets the definition of "qualifying good" in Section A of Annex 703.2. **Note 1: This criterion does not apply to goods that wholly originate in Canada or the United States and are imported into either country. Note: A tariff rate quota is not a quantitative restriction.**

Field 8: For each good described in field 5, state "YES" if you are the producer of the good. If you are not the producer of the good, state "NO" followed by (1), (2), or (3), depending on whether this certificate was based upon: (1) your knowledge of whether the good qualifies as an originating good; (2) your reliance on the producer's written representation (other than a Certificate of Origin) that the good qualifies as an originating good; or (3) a completed and signed Certificate for the good, voluntarily provided to the exporter by the producer.

Field 9: For each good described in Field 5, where the good is subject to a regional value content (RVC) requirement, indicate "NC" if the RVC is calculated according to the net cost method; otherwise, indicate "NO". If the RVC is calculated according to the net cost method over a period of time, further identify the beginning and ending dates (DD/MM/YY) of that period. (Reference: Articles 402.1, 402.5)

Field 10: Identify the name of the country ("MX" or "US" for agricultural and textile goods exported to Canada; "US" or "CA" for all goods exported to Mexico; or "CA" or "MX" for all goods exported to the United States) to which the preferential rate of customs duty applies, as set out in Annex 302.2, in accordance with the Marking Rules or in each Party's schedule of tariff elimination.

For all other originating goods exported to Canada, indicate appropriately "MX" or "US" if the goods originate in that NAFTA country, within the meaning of the NAFTA Rules of Origin Regulations, and any subsequent processing in the other NAFTA country does not increase the transaction value of the goods by more than 7%; otherwise indicate as "JNT" for joint production. (Reference: Annex 302.2)

Field 11: This field must be completed, signed and dated by the exporter, when the Certificate is completed by the producer for use by the exporter, it must be completed, signed and dated by the producer. The date must be the date the Certificate was completed and signed.

Appendix 3: Australia Productivity Commission ROO Index

Index Structure and Restrictiveness Ranking[39]

In constructing the index, a bottom-up approach has been used, whereby the detailed information on each agreement was collected and assessed for regulations governing preferential ROO, before being aggregated into a single restrictiveness index value for each agreement. The detailed information was grouped into three broad groups:

- *primary criteria* reflecting the main methods of origin determination;
- *supplementary criteria* for other provisions related to preferential ROO; and
- *other effects of ROO.*

The basic structure of the index is reported in Table 3.1. The categorization adopted reflects the methods, or tests, of origin determination canvassed by the World Customs Organization (WCO), and regulations that have evolved to support the application of those tests.

The possible restrictiveness of each of the 11 criteria listed in Table 3.1 was first measured by identifying the variants by which each criterion is applied and then subjectively assigning restrictiveness scores to each item according to the likely restrictiveness of the variant. The scores assigned range from zero for the least restrictive variant to one for the most restrictive variant identified. According to this structure, the greater the likely restrictiveness of a provision, the higher the score it has received. The score of zero is also applied when a provision is not identified as part of a ROO regime.

To complete the index, the score assigned to each item was aggregated according to the weights shown in Table 3.1. In principle, it would be most desirable to determine the index weights empirically using regression techniques after controlling for all factors that may determine trade and industrial organization, at the margin. In practice, this has not been possible and rules of thumb have been employed.

The primary criteria consist of three subcategories. The weight assigned to the primary criteria, as a group, is 0.6 out of a total weight of one. This relatively high weight was assigned to this group because of the likely predominance of the tests in origin determination. Group weights are further disaggregated into subgroups on the basis of frequency of use and their likely importance in ROO regimes.

Two main origin tests – the CTC and RVC methods – are each given a relatively high weight of 0.2, reflecting their predominance as primary tests in ROO regimes.

Sector-specific rules are generally defined through the specified manufacturing process test.[40] These tests are applied in conjunction with other tests (commonly, the CTC

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[39] This appendix features section 2.1 from the Australia Productivity Commission (2004b).

[40] Nearly 90% of PTAs analyzed by the WTO (2002).

method). However, they are still essentially primary criteria and can be relatively restrictive. They are therefore given a separate weight of 0.2.

Table 3.1 Restriction Categories for Preferential ROO

Number	Restriction Category	Weight
Primary criteria		**0.60**
1	Change in tariff classification	0.20
2	Regional value content or percentage criterion	0.20
3	Specified manufacturing process test and/or sector-specific rules	0.20
Supplementary criteria		**0.25**
4	Type of cumulation	0.05
5	Provisions that go beyond cumulation	0.05
6	Duty drawback	0.05
7	Territoriality or outward processing	0.05
8	Geographic location of manufacturing process	0.05
Other effects of ROO		**0.15**
9	Degree of certainty	0.05
10	Compliance and administration costs	0.05
11	Rigidity	0.05
Total weight		**1.00**

Sector-specific ROO are also commonly more stringent than rules of general application, especially for so-called "sensitive" sectors, as they are generally designed to shield those sectors from import competition. Because of the potentially large relative impact that sector-specific rules can have on the restrictiveness of the ROO regimes, the weight of 0.2 is considered appropriate in the presence of such provisions.

There are several other features of ROO which can influence whether or not origin is conferred on a product and hence determine the impact of the ROO regime on trade flows. These are cumulation rules, tolerance or de minimis thresholds, duty exception and drawback provisions, the extent of permissible outward processing and the last stage of manufacturing process requirement. These features are included as supplementary criteria and allocated one fourth of the total index weight, with uniform weights being allocated between five subcategories.

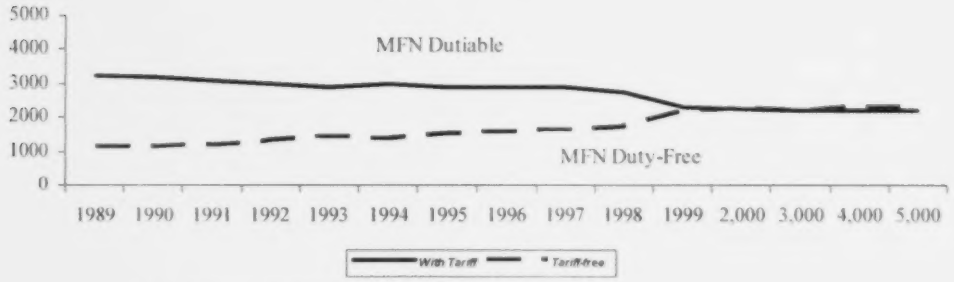
Where different variants of the same criterion are applied, the origin rule was scored according to the variant assessed as the one most commonly applied, that is, the most common threshold level when multiple threshold levels are used and the most common digit level of CTC when multiple levels are used. For example, the CTC can be applied at the chapter (two digit), heading (four digit) or item levels (six or eight digit). An agreement using the CTC method was scored according to the level most commonly applied. This relatively conservative approach may understate the true restrictiveness of a regime at the margin, which quite possibly could be determined by the most restrictive variant applied.

In this framework, the highest restrictiveness scores were assigned to more complex origin rules using the more restrictive variants of each criteria and/or incorporating sector-specific provisions. Lower scores were assigned to rules that are relatively "clean," that is, free of deliberately restrictive provisions (such as sector-specific rules).

Appendix 4: How Has the Usage of Tariff-Free Subheadings Changed?

There are over 5,000 commodity groupings at the HS six-digit subheading level. However, actual US imports from Canada cover around 4,500 commodities at the HS six-digit level.[41] The distribution of US imports from Canada through time demonstrates relatively constant growth in the number of MFN duty-free subheadings used since 1989 until 1999. Since then, there is about an equal number of commodity groupings that are MFN duty free versus those that have MFN tariffs. Figures 4.1 displays the growth in MFN duty-free and dutiable subheadings used for US imports from Canada since 1989.

Figure 4.1: MFN Tariff and Tariff-Free Sub-Headings
US Imports from Canada



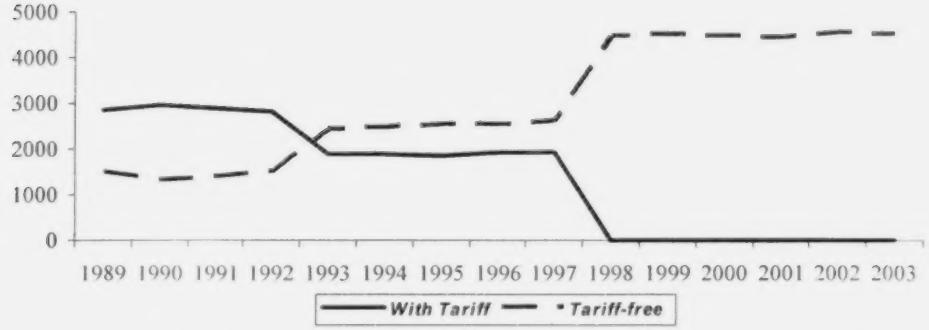
Source: Authors' calculations based on USITC data.

Focusing on subheadings for NAFTA imports from Canada into the United States, we see growth in NAFTA duty free subheadings until 1993, a levelling off in the number of duty-free subheadings in 1993 and a large rise in NAFTA duty-free subheadings used in 1997 peaking in 1998. This pattern is a reflection of the final phase in of the FTA and is illustrated in Figure 4.1. Almost all subheadings and hence tariff lines since 1998 are NAFTA duty free.

When comparing figures 4.1 and 4.2, we observe significantly more duty-free subheadings used under NAFTA (4,500 subheadings) compared to duty-free subheadings used under MFN (2,300 subheadings).

[41] We make the distinction between available subheadings and subheadings used. The former represents the subheadings as defined by the HS codes while the latter represents the subheadings reflected in the actual trade data. We employ the latter since we use annual trade data which does not include all available subheadings.

Figure 4.2: NAFTA Tariff and Tariff-Free Sub-Headings
US Imports from Canada

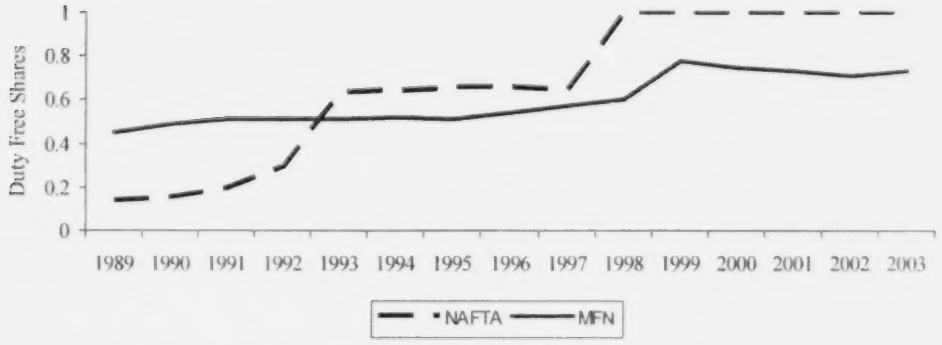


Source: Authors' calculations based on USITC data.

What percent of US imports from Canada enter duty free? We use the information expressed in terms of an average of the 21 HS sections analyzed earlier in this paper. Since 1998, only about 75% of the value of MFN imported commodities in each section that were claiming MFN status were entering into the United States from Canada duty free, versus nearly 100% for NAFTA. This is illustrated in Figure 4.3.

It is interesting to note that even though nearly 100% of NAFTA imports entered the US duty free in 1998 as indicated in Figure 4.3 and NAFTA duty-free lines peaked in 1998 as shown in Figure 4.2, NAFTA utilization had peaked in 1997 and declined thereafter as shown earlier in Figure 7.

Figure 4.3: FTA-NAFTA and MFN Duty Free Import Shares
US Imports from Canada



Source: Authors' calculations based on USITC data.